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### ELECTRIC RAILWAY TRACTION

*A Supplement illustrating and describing developments in Electric Railway Traction is presented with each copy of this week's issue.*

### The L.M.S.R. Staff College

THE appointment of Colonel Manton as Principal of the London Midland & Scottish Railway Staff College at Derby, announced in our issue of January 15, is of unusual interest, and his views on the policy and future of the college are therefore noteworthy. In anticipation of the opening of the college at the end of this year he is at present engaged in framing a suitable curriculum for the railwaymen-students, a difficult task, as every side of the vast enterprises of the railway has to be considered. As Colonel Manton pointed out, in conversation the other day, this curriculum, when duly hammered out and condensed into a workable programme for the first year's work at the college will necessarily be experimental. Much depends upon what it is finally decided should be included in the courses of training, and until these decisions are made, it is impossible to say whether each course should last for two or more weeks, and also how many tutors should comprise the instructional staff. Colonel Manton, discussing the need for literature on the best practices and ideas in the wide field of railway operation, instanced the working of a marshalling yard. At three such yards the yardmasters may do the job in three different ways, yet each in the way best suited to his own yard; but no one has yet put down in writing the reasons for these differences in working. The collating and recording of such information and, in fact, of all the best traditions of railway operation, for the benefit of the younger men is, Colonel Manton emphasised, one of the main functions of the college. As Principal, his aims will also include the avoidance of a "school" atmosphere, and, instead, the encouragement of exchange of ideas by the informal talking of "shop." This will be assisted by friendly rivalry among the students on the college recreation grounds, which bids fair to banish departmental and social barriers. As a means of practically illustrating theories, Colonel Manton has great faith in the cinema and the model railway, but on the other hand he does not believe in examinations, as it often happens that the most efficient men cannot adequately express themselves in writing. His conception of the principal aims of the college are the development of initiative, leadership and knowledge, so that when a student leaves it he will be conscious that he knows why he is doing his particular job, and the best way of doing it.

* * * *

### The Week's Traffics

At this time last year the receipts of the four group companies were influenced by the passenger movement in connection with the National mourning, and merchandise traffics in that week were slightly lower except on the L.N.E.R. Coal takings were, however, £60,000 up. For the past week this year coal traffics are £36,500 down, whereas net increases of £3,000 and of £46,500 are shown in passenger train and merchandise receipts respectively. Passenger train traffics to date are £4,057,000, an increase of £50,000, and the merchandise receipts of £4,097,000 are £96,500 up, but the £2,780,000 coal traffics are £195,500 down. Merchandise receipts to date show an increase of £69,000, or 3·86 per cent. on the L.M.S.R., and one of £23,000, or 3·23 per cent. on the Great Western. Southern passenger train takings are up £28,000, or 2·90 per cent.

| | 4th Week | | | | Year to date | |
|---|---|---|---|---|---|---|
| | Pass., &c. | Goods, &c. | Coal, &c. | Total | Inc. or Dec. | |
| | £ | £ | £ | £ | £ | % |
| L.M.S.R. .. | + 5,000 | + 21,000 | − 12,000 | + 17,000 | + 8,000 | + 0·18 |
| L.N.E.R. .. | + 3,000 | + 17,000 | − 13,000 | + 7,000 | − 38,000 | − 1·14 |
| G.W.R. .. | − 9,000 | + 8,000 | − 6,000 | − 7,000 | − 11,000 | − 0·60 |
| S.R. .. .. | + 4,000 | − 2,500 | − 5,500 | − 4,000 | − 8,000 | − 0·59 |

London Transport receipts for the past week show a decrease of £16,200, but in the corresponding week a year ago they were £41,400 up.

* * * *

### Turkish State Railways

With the purchase of the undertaking of the Oriental Railways Company as from January 1, 1937, the Turkish Government has completed the nationalisation of all the main-line railways in its territory. The Government has now in operation 6,340 kilometres, including 5,907 km. of 4 ft. 8½ in. gauge, 124 km. of 5 ft. (1·524 m.) gauge, 41 km. of 3 ft. 5¼ in. (1·05 m.) gauge, and 268 km. of 2 ft. 6 in. (0·75 m.) gauge. It also controls the working of the Hydarpasa, Derince, and Mersin Harbours. Gross receipts from its combined operations in 1935 were £T.21,899,672, of which £T.5,305,010 came from passengers and £T.15,643,597 from goods. Working expenses amounted to £T.14,022,123, and the sum of £T.5,466,843 was applied to the annual purchase instalment of lines acquired. For some years past the Turkish Government

has been gradually acquiring the concessional lines in Asiatic Turkey, culminating in the purchase as from June 1, 1935, of the British-owned Ottoman Railway from Smyrna to Aidin, which, with its extensions, had a total length of 379¼ miles. The railways now acquired in European Turkey were worked by the Société des Chemins de fer Orientaux, a French company with headquarters in Paris. They comprise isolated sections totalling 338 km. (210 miles), and the main line of 175 miles from Maritza (on the Greek frontier) to Istanbul forms part of the main line to the East used by the Orient expresses.

* * * *

### The German State Railway

Some kind of reorganisation of the German State Railway is foreshadowed by Herr Hitler's statement last Saturday that he intended placing the Reichsbahn again unconditionally under the sovereignty of the German Reich. Under the Dawes plan of 1924 the railways of Germany were handed over to a company to be worked as a commercial undertaking in the interests of efficiency, subject to certain obligations as to the payment of reparations. The company was administered by a managing board of eighteen, of which nine members were appointed by the German Government, five German members by the Reparations Trustee, and four foreign members by the Reparations Trustee. A German managing director was also appointed. Certain alterations in the financial arrangements were made under the Young plan of 1930, which also reinstated an exclusively German management. Reparation payments were suspended in 1932. Dr. Julius Dorpmüller, who was at first Deputy General Director of the Reichsbahn and later became its General Manager and Chairman, has now been appointed Minister of Transport, but he will continue to act as General Manager of the railways until a new form of railway organisation has been settled. Dr. Dorpmüller has now had 43 years of railway service.

* * * *

### Tasmanian Government Railways

There was a satisfactory increase of £4 · 849 in gross earnings of the Tasmanian Government Railways in the year ended June 30, 1936, as shown by the report received from Mr. F. P. St. Hill, Commissioner for Railways. Working expenses, however, increased by £52,274, caused by making up arrears of belated repairs and by the additional business handled. An order has been placed for four all-steel buffet cars, and the number of Sentinel-Cammell cars on order has been increased from two to five. An extension of the Derwent Valley line was brought into working during the year, and early completion of the "Backbone" and Andover deviations of the main line is expected. These deviations will enable greater goods train loads to be handled between Antill Ponds and Colebrook.

| | 1935–36 | 1934–35 |
|---|---|---|
| Average miles | 645 | 645 |
| Passengers | 2,321,823 | 2,133,541 |
| Goods and minerals, tons | 745,643 | 656,333 |
| Train-miles | 1,418,519 | 1,233,350 |
| Operating ratio, per cent. | 125·77 | 118·06 |
| | £ | £ |
| Passenger receipts | 120,328 | 111,578 |
| Goods and minerals receipts | 274,451 | 236,857 |
| Total earnings | 448,614 | 399,764 |
| Working expenses | 470,218 | 417,944 |
| Loss on working | 21,604 | 18,180 |

Traffic control should be in operation during the current financial year. In addition to ordinary working expenses provision is being made to the extent of £94,000 for depreciation, compared with £54,000 in the previous year.

### Railway Carriage Views

A disadvantage of the photograph as a medium for views displayed in railway carriages, is that it is likely to catch some aspect of fashion or mode of transport which causes it to look archaic in a few years. The artist can avoid or gloss over such inconvenient detail, so that his work remains alive and compelling after that of the photographer may have become interesting as a curiosity but of dwindling value as an advertisement. The Southern Railway, like the L.N.E.R., is using pairs of coloured etchings for carriage decoration, and we reproduce a selection of them on page 242. A letter on page 226 from Mr. C. Grasemann, the company's Public Relations and Advertising Officer, reminds us that these, the work of the late Mr. Donald Maxwell, were introduced early in 1936. We have already emphasised, in reviewing the L.N.E.R. etchings in our issue of November 6, the growing importance (and publicity value) of railway carriage views in these days of increased opportunities for cheap long-distance travel. Many in the Southern Railway series reflect most successfully in their colouring and execution that charm peculiar to the English scene which often eludes the camera, and the whole series is a valuable contribution to the incidental pleasures of travelling by train.

* * * *

### German High-speed Business Travel

In various respect the diesel high-speed railway services of Germany are unique. Between them they are responsible for maintaining the fastest group of schedules in the world, four of which are timed at over 80 m.p.h. from start-to-stop, and twelve at over 75 m.p.h. Even so great a distance as the 267·4 miles from Berlin to Hamm is covered daily at 81·4 m.p.h. throughout, inclusive of an intermediate stop at Hanover. The early criticism of cramped accommodation can no longer be applied to the seating of the present-day diesel units, which, as the illustration on page 240 of this issue reveals, is of the most comfortable and spacious description, with restaurant facilities permitting the service to passengers of excellent meals where they sit. It is the business man who stands most to benefit, as from almost all the greatest cities in Germany—Cologne, Frankfort, Stuttgart, Munich, Nuremberg, and Breslau, by leaving home in the early morning, he can reach the capital by or shortly after midday, and leaving Berlin from 5 to 7 o'clock in the evening, be back to his own city by midnight, so not needing to spend a night away. From Cologne, for example, starting at 7.20 a.m., the passenger is brought 360 miles into Berlin in 4 hr. 49 min., does not need to leave Berlin (Zoo) again till 7.22 p.m., and is back in Cologne six minutes after midnight, so having travelled the equivalent of Dunbar to London and back, and had over seven hours in the capital for his business. Day traffic from Hamburg to Berlin, however, is so considerable as to demand a full length steam-hauled express, though this is only 7 min. slower than the diesel-driven Fliegende Hamburger.

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### A Czechoslovak Railcar Interior

Two views reproduced on page 241 show the seating and interior arrangements of a railcar on the Czechoslovak State Railways, the decoration of which has been entrusted to one of the country's leading design artists. The car being streamlined, a corresponding suppression of unnecessary detail marks the internal decorative scheme, the chief interest of which, otherwise, lies in the colouring. A warm brown matt lacquer finish has been used, harmonising with the walnut of the doors. The curtains are

in a rough hand-woven cream wool cloth, shot with brown threads, and the upholstery of the seats is carried out with a striped material in tones of red-brown and buff. The only criticism we would venture is that the backs of the seats strike us as a little too upright for comfortable relaxation. Had they been of the individually adjustable reclining type used on some American high-speed trains, and occupying little if any more space, the designer would have achieved still more successfully his object of evolving an interior epitomising the highest standards of modern railway travel.

* * * *

**Panic on Two Footplates**

A summary of Colonel Woodhouse's report on the unusual accident of July 29, 1936, on the Somerset and Dorset Joint line, when an engine propelling some wagons ran away unattended, appears on page 250. The main feature of the case is the extraordinary action of the enginemen in leaving their footplates. It is seldom that a locomotive is started off with the regulator open and nobody on it, and only a complete system of A.T.C. can really meet such an emergency. The signalmen past whom the runaway sped did what little they could. Colonel Woodhouse suggests that it would be advisable at certain signal boxes for the "train running away" signal to be forwarded immediately on receipt, before action, which may be of little use, is taken with flags or detonators. Where runaways are at all likely, some means of giving a general alarm all along a length of line, as with the German *Läutewerk* bell signalling, might conceivably be a useful precaution. It was on the Radstock—Bath section of the S. & D.J.R.—the scene of the accident of July 29 last—that, on November 20, 1929, a goods train ran away, the enginemen being overpowered by fumes in Combe Down tunnel; and near Radstock occurred one of the few fatal single-line collisions in this country, on August 7, 1876, in which 12 passengers were killed.

* * * *

**Rail Welding on the Underground**

There has been a good deal of reference in the press during the last year or two to the efforts being made by the London Passenger Transport Board to reduce the noise of travel on the Underground, and particularly in the tubes. Of the many nerve fraying characteristics suffered by dwellers in great cities, few can be more productive of mental derangement than noise, and anything the authorities can do to lessen it is welcome. For some years experiments have been made with the end-to-end welding of rails on sections of the tubes, the Thermit system having been used, and having produced a remarkabe diminution in the noise of travel. Further, the reduction in the number of joints is beneficial from the purely engineering point of view, and the two advantages have led to the decision to adopt welded track on all sections of line subjected to appreciable variations of temperature. The method to be adopted generally is the flash-butt system, which will be carried out on a fixed plant at the permanent way depot at Lillie Bridge, the rails then being transported in lengths of about 360 ft. to the site. An additional mobile plant will also be purchased to be used at first at equipment depots established in connection with new works. Not only will new rails be welded and laid in long lengths, but it is proposed to take out existing rails, weld them, and relay them.

* * * *

**120-ft. Rails**

Although conditions are scarcely ready for the general elimination of rail joints in the open, where the rails are subject to considerable temperature variations, yet there are circumstances in which the use of longer rails than the normal may be justified. Such long rails can of course be obtained by welding alternate joints of existing rails, but it is obviously better if the rails can be supplied in one piece from their point of origin. Hitherto the longest length thus found practicable, from the manufacturing standpoint, has been the 90-ft. rail which has had a limited use in this country, and the 30-m. (98 ft. 5 in.) rail which is now standard for main line use in Germany. Last week, however, what is believed to be a world's record was established by a steelworks on the North-East Coast of England in producing 100 lb. per yd. steel rails no less than 120 ft. in length. These rails, each of which weighs about 35 cwt., are for the use of the Southern Area of the L.N.E.R., and are to be laid in the main line at Holme, south of Peterborough, as a point where high speeds are normally run by express trains. The problems of their handling and their behaviour in service will be watched with unusual interest.

* * * *

**Nickel Steels and Weight Reduction**

During the past year American railways showed an active interest in the weight reduction of rolling stock, and made increasing use of nickel steel for bogie castings for freight vehicles, and of rolled nickel alloy steels in the construction of the wagon bodies. The improved earnings of many of the railways led to the placing of orders for these materials on a larger scale than heretofore, the quantities ranging from 250 sets to as many as 2,000 in one instance. Increases in the production of steam locomotives resulted in an even larger demand for nickel steels in this field as well, and whilst the Canadian railways still lead in the use of this material for engine parts, the American systems are becoming more interested in the practice. Nickel steel is used for boiler plates, including tube plates, and in the construction of the fireboxes, together with nickel steel rivets, nickel cast-iron cylinders, and bushings and forgings of the same material for coupling and connecting rods, axles, crankpins and piston rods. An authenticated statement on the subject points out that wherever diesel power units have been introduced by the railways, increased use of nickel alloys results. The standard material for cylinders and liners recognised by one of the leading American locomotive manufacturers is a nickel cast-iron which permits of a reduction in weight combined with added strength.

* * * *

**Hudson Type Locomotives in France**

What with electrification of main lines and the rejuvenation of old locomotives by the ingenious methods for which Monsieur Chapelon is responsible, the French railways have produced no new locomotive designs for main line express services for some years, and the proposal of the Nord to build eight new 4-6-4 or Hudson type locomotives is therefore of special interest. The designs have been worked out by the O.C.E.M. as a result of a mission sent to America in 1934 by the French railways. Four of the locomotives are to have three simple expansion cylinders, and four will be four-cylinder compounds. Both types will be equipped with Dabeg R.C. poppet valves and will work at a pressure of 20 hpz. (290 lb. per sq. in.). They will be extremely powerful locomotives, designed to develop 3,000 h.p. with boilers of 3,500 h.p. capacity, the rate of combustion for this output being limited to 300 and 400 kg. per sq. metre of grate area in order to ensure efficiency. Although these locomotives have not yet been ordered they have been authorised and their behaviour in service will be looked forward to with great interest as likely to set a new and even higher standard of locomotive performance in France.

XUM

## Australian Commonwealth Railways

FOR the Commonwealth Railways as a whole the result of working for the year ended June 30, 1936, showed a surplus of earnings over working expenses of £252, against a deficit of £33,983 for the previous financial year. Since the inauguration of the Commonwealth Railways surpluses had previously been achieved only in the three years 1926-27 to 1928-29 inclusive, when the respective surpluses were £27,213, £62,397, and £5,433. The better result in each of those three years was, however, due entirely to revenue from the conveyance of material for the construction of extensions. For the year under review the earnings were on the whole higher by £42,024 than for the previous year, as revenue expanded on each system except the North Australian, and working expenses increased by only £7,789. The best showing was made by the Trans-Australian Railway with a surplus of £45,232, against one of £19,887 for the previous year. Its earnings improved by £28,895, and expenses by only £3,550. This expenditure does not include £101,688 for sleeper renewals from funds specially provided by the Treasury. On the Central Australia Railway the loss on working was reduced from £50,374 to £37,438. Revenue was generally better and the comparatively small advance in expenditure was chiefly due to increased business and storm damage. Profit on working the Federal Territory Railway increased from £215 to £430. The isolated system of the North Australia Railway showed a deficit of £7,972, compared with £3,711 for the previous year. A decrease in mining activity in the Northern Territory was the cause of the change.

| | Earnings | | Working Expenses | |
|---|---|---|---|---|
| | 1935–36 | 1934–35 | 1935–36 | 1934–35 |
| | £ | £ | £ | £ |
| Trans-Australian Railway (Port Augusta-Kalgoorlie, 1,051 miles 68 ch., 4 ft. 8½ in. gauge) .. | 246,653 | 217,758 | 201,421 | 197,871 |
| Central Australia Railway (Port Augusta — Alice Springs, 771 miles 33 ch., 3 ft. 6 in. gauge) .. | 100,981 | 83,522 | 138,419 | 133,896 |
| North Australia Railway (Darwin—Birdum, 316 miles 40 ch., 3 ft. 6 in. gauge) .. .. .. | 33,662 | 38,273 | 41,634 | 41,984 |
| Federal Territory Railway (Queanbeyan - Canberra, 4 miles 75 ch., 4 ft. 8½ in. gauge) .. .. .. | 6,413 | 6,132 | 5,983 | 5,917 |
| Total, 2,144 miles 56 ch... | 387,709 | 345,685 | 387,457 | 379,668 |

On the Trans-Australian Railway the number of through passengers showed a considerable increase over recent years. There was also a marked increase in the quantity of goods traffic, both to and from Western Australia. The increase was largely due to the dislocation of the coastal steamer service, on account of the seamen's strike. By agreement between the Commonwealth and the State of South Australia the Commonwealth standard gauge railway is being extended from Port Augusta to Port Pirie, a distance of 56¼ miles, and South Australia is extending its 5 ft. 3 in. gauge line from Red Hill to Port Pirie, 27¾ miles. The Commonwealth section is due to be completed by July 5, 1937. By the completion of these new lines changes of trains will be eliminated at Adelaide, Terowie, and Port Augusta, and the saving in distance compared with the existing route via Terowie will be 70 miles. For the fast trains which will be run when the new timetable is introduced via Port Pirie, the Commonwealth Railways administration has ordered eight locomotives which will be capable of hauling considerably heavier loads at the express speed that will be necessary. The tenders will have a coal capacity of 17½ tons and will carry 12,000 gallons of water. The first air-conditioned car (first class lounge) was placed in service on February 18, 1936, a dining car is being air-conditioned, and tenders are being called for a further four sets of air-conditioning installations which will be used to equip two dining cars and two lounge cars.

* * * *

## The Rates Question in India

ROUGHLY half of Mr. H. N. Colam's presidential address at the recent (35th) session of the Indian Railway Conference Association was devoted to the subject of goods rates. In recommending that the association should issue a series of memoranda explaining the railway case to the commercial community, he emphasised that, first and foremost, the rating structure must be understood by that community, and also the principles underlying it and the consequences. Indian railway charges were, he pointed out, graded in two steps; (1) the general classification consisting of 16 classes; and (2) special rates of various kinds ranging between the maximum and minimum for the class. As a general rule the higher the intrinsic value of a commodity, the higher the classification and charge. Maximum and minimum charges were fixed for each class, the former being known as the class rate. To prove the necessity for such grading as opposed to a common rate for all commodities, it was necessary only to point out that the average charge on all Indian Class 1 railways was fractionally over ½d. a ton-mile, and that if this rate were applied to coal it would double its cost at 100 miles from the colliery; the costs of most grains would, however, not be doubled until they had been carried 2,000 miles, and for higher-valued commodities the distance would be much greater still. If the same rate were charged in all cases, it would both be inequitable, and severely restrict the movement of lower-valued commodities as well as crippling the development of the country. The grading in the classification could not, however, pretend to take account of all the differences between commodity values, nor would this necessarily be desirable. The special rates were provided to cater for cases in which a commodity, though able to pay the class rate for certain distances and in other favourable conditions, could not do so in less favourable circumstances without restricting movements and trade. In actual practice grading, though essential, made it necessary for lower-priced commodities and those moving long distances, which did not pay their share of the cost of transport, to be subsidised by others that could afford to do so. To take an extreme case, those charged only ¼d. a ton-mile were balanced by others charged 4d. a ton-mile, just as in the Post Office losses on long-distance packages were compensated by local postal services.

Mr. Colam went on to enumerate what are, apparently, the changes desired in " the insistent and fairly widespread demand for a complete revision of this rating structure," namely :—

1.—Correlation to some economic plan designed to effect the economic recovery of the country.

2.—Introduction of uniform charges for all commodities on all railways and on all parts of the same railway.

3.—Charges at telescopic rates to be based on total journey mileage instead of on separate journeys on different railways passed over, as at present.

4.—Abolition or severe curtailment of special rates and, instead, charges to be assessed by a body largely composed of representatives of trades, business, &c.

Dealing with these points *seriatim* he pointed out that

such national economic plans are no business of the railways, and even their offers of assistance had so far been considered premature by those framing the plans. As to the introduction of uniform charges for the same commodity on all railways and sections of railways, Mr. Colam showed by actual figures and sound reasoning that such a demand was entirely unreasonable. Rates must vary with differences in cost of transport due to variations in gauge, geographical conditions (including flat or mountainous country traversed), richness of country tapped, and above all, density of population and of traffic. The figures quoted by him give comparative costs of transport, average charges, and densities of traffic, on four broad- and two metre-gauge railways, and clearly show these proportional variations. Continuing his line of argument, the President made it clear that if a uniform charge were made, it would have to be a mean for all railways and would result in ruination for many who had built up businesses on low freight rates—possibly the highest the railway considered their commodities would bear—as they might easily have to face a 50 per cent. increase. The abolition or curtailment of powers to quote special rates in India would, he contended, share the fate of the recent decision of an outside authority to impose a new rates structure on British railways. There, the old system of special rates had to be reverted to so quickly that on one section of one of the British railways, serving an area of only about 200 × 100 miles, over 700,000 special rates were quoted in the eight years after the introduction of the new system, and were still being added to at the rate of 50,000 per annum. Moreover, the specified annual revenue from the new scheme had never once been attained, and the actual figure was approximately 40 per cent. below it during the last three years. Similarly, any attempt to simplify the Indian rating structure would almost certainly produce a period of dislocation and uncertainty followed by a new crop of special rates.

In emendation of this analogy by Mr. Colam, we would point out that the British main-line railways had, of course, a considerable say in the 1928 revised classification, and it was hoped that by the institution of 21 classes, giving a more elastic range of "commodity freight values" than in the old 8-class classification, the need for granting exceptional figures would disappear, although any then-existing special rates would continue in operation. However, the incubus of road transport, with its own peculiar charging system, quickly forced the railways to use the new standard charges as an ideal, for occasional consignments or for traffic not vulnerable by road competition. The large number of exceptional figures issued by the British railways since 1928 is not an attempt on their part to get away from the new standard scale of charging, but is due almost entirely to the rise of road competition, which has forced them to bring their rates into line with those operating by road. In fact, had it not been for this acute competition, there would have been very few exceptional rates quoted after the new standard rates came into operation. As to the 40 per cent. lag behind standard revenue, it must be borne in mind that this embraces passenger earnings and all ancillary undertakings. However, the fact remains that, though it was hoped to eliminate exceptional figures, special rates have actually increased very greatly, and Mr. Colam's main contention—that abolition or severe curtailment of special rates is impracticable—is therefore, borne out.

Another very important point made in the address was that, apart from their inevitability and economic value, enabling commodities to move that otherwise would not do so, special rates enabled the general level of rail transport charges to be brought down. In India these charges were asborbed in the proportion of (*a*) interest, 35 per cent.; (*b*) fixed working expenses not varying with the volume of traffic (administration, maintenance of track and buildings, station staff wages, quarters, &c.), 40 per cent.; and (*c*) variable working expenses depending on the traffic carried, 25 per cent. So that if, for example, by quoting special rates equal to 75 per cent. of existing charges, resulting in an increase in traffic of 20 per cent., earnings went up by 15 per cent. with an addition of only 5 per cent. in operating costs, a general reduction of charges by 12 per cent. would be possible. In most businesses the resulting increase in net earnings would go to swell the dividends of shareholders, but on railways in India and most other countries the increased profits were, the speaker pointed out, returned at some time or other to the public in the form of reduced rates. This actually happened in India in the boom years to the extent of a lowering of fares and of freights on kerosene oil, manures, &c., by some £2,250,000 per annum. This action was not justified by subsequent events, but it was a fact to be remembered now, when an attempt was being made to correct the error by raising the rates again where reasonably possible.

To sum up this question of rates, therefore, it was, Mr. Colam said, very doubtful whether a better system could be devised, and this certainly could not be done "at one sitting, so to speak" or without widespread dislocation of existing trade, and, at any rate initially, without a raising of rates. As subsequent effects of revision could not be foreseen, rates would have to be pitched high in the first instance to ensure that a further big deficit in railway revenues did not occur. Meanwhile the railways realised that the existing system was far from perfect and were constantly trying to remove its imperfections and meet trade requirements. Proposals for special rates were frequently being received from groups of, or individual traders, but these parties were often trying to obtain advantages over their competitors, and the railway concerned had to consider the effects of such proposals upon other customers in order to avoid dislocation of business. Furthermore, it should be borne in mind that it was impossible to satisfy everybody, and the public heard very little from those who were satisfied, but a great deal from those who were not. "It is, therefore, most important that, before further pressure is brought to bear, to force a change in the present system of quotation of special rates, the very problematical gains that might be achieved should be weighed against the undoubted advantages of the existing system which would be sacrificed," were the final words with which the President concluded his remarks upon this vexed question of the revision of the rates structure in India.

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OLD BRIDGE GIRDER SPANS AS CULVERTS.—According to the *Canadian National Railways Magazine*, large plate-girder bridge spans, removed from the line, as not being strong enough for modern traffic, are being used in Canada as culverts for the passage of cattle from one side of a line to the other. They are placed transversely through the foot of fairly high embankments, and are of such a size that cattle can pass through them between the girders. By avoiding the purchase of large concrete pipes for these culverts, it is claimed that, in material alone, over £4 a lineal foot of culvert is saved, and that as the spans, which are about 100 ft. long, can so easily be dropped bodily into place, much labour also is saved. Though, it is true, these old spans are said to be of iron, and not steel, it would be interesting to know how long they resist serious corrosion, and whether they are provided with any special protection against it; the nature of the soil would, of course, be the governing factor.

XUM

# LETTERS TO THE EDITOR

*(The Editor is not responsible for the opinions of correspondents)*

## Coloured Etchings in Carriages

Southern Railway,
General Manager's Office,
Waterloo Station, S.E.1,
January 22

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—In view of the interest caused by the London & North Eastern Railway's new type of decoration for compartments in the form of coloured etchings, it is interesting to note that the Great Western Railway used to have coloured sketches in its compartments some years ago, and last year the Southern used sketches by the late Donald Maxwell for the first time instead of photographs. The sketches appeared in compartments for the first time early in 1936.

Yours faithfully,
C. GRASEMANN,
Public Relations and Advertising Officer.

[A selection of the sketches referred to is reproduced on page 242 and we comment upon them in an editorial note on page 222.—ED. *R.G.*]

## Connections

London, January 11

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—West Cumberland and North Lancashire are, I believe, regarded as among the depressed areas. The local railway service also seems designed to depress those who visit these areas from other parts of the country. I have just travelled across from Newcastle-on-Tyne to Barrow-in-Furness, by the 5.20 p.m. from Newcastle, making a smart connection at Carlisle (7.5-7.12 p.m.) with an express to the south. This is due at Oxenholme at 8.27 p.m., missing the last train from there to Barrow by 15 min., and at Carnforth at 8.46 p.m., from which the Barrow connection has departed 11 min. earlier. The next train from Carnforth to Barrow is at 9.53 p.m., 67 min. later. If I travel from Barrow to Euston by the 4.5 p.m. express, I have the pleasurable excitement of seeing the Midday Scot dash through while we are waiting at Carnforth, of running into Lancaster 4 min. after it has departed for London, and of reaching Euston 80 min. later.

Frequently I have to visit Workington, in West Cumberland. Should I travel from Euston by the Midday Scot, due in Carlisle at 7.35 p.m., it is to find that the Workington train has gone at 7.10 p.m., and that the next is at 9 p.m., 85 min. later; or there is, of course, the alternative of alighting at Penrith and waiting there 53 min. Should I be travelling from Sheffield or Leeds to Workington, the morning express reaches Carlisle at 12.53 p.m., and if I am lucky I may just see the tail of the 12.50 p.m. for Workington and Whitehaven disappearing round the curve; if the journey is in the afternoon, with the Thames-Clyde express, I shall have a similar experience, as the latter is due in Carlisle at 4.15 p.m., and the Workington train leaves at 4.12 p.m. Modest waits are then entailed of 47 min. at the midday hour, and exactly 2 hr.—a nice round figure—in the evening. Better still, should I come down from Glasgow on the 12.10 noon express, due at 2.40 p.m., I may possibly be in time even to see the guard's flag waved in the distance to speed on its way the 2.40 p.m. to Workington and Whitehaven, but of course without catching it; then follows a wait of 92 min. for the next.

In the circumstances it is hardly surprising that a fleet of cars plies daily over the 35 miles between Workington and Carlisle carrying officials of and visitors to the important iron and steel works at Workington, to and from their trains at Carlisle. I heard recently that one of these gentlemen, having to attend a meeting in London, and not desirous of spending a night away, drove his car from his home near Maryport to Carlisle to catch the L.N.E.R. 8.10 a.m. express to Newcastle, due there at 9.49 a.m.; travelled by the Silver Jubilee to King's Cross, due at 2 p.m.; had 3½ hr. in London, which was ample for his purpose; returned by the 5.30 p.m. Silver Jubilee to Newcastle; and reached Carlisle by L.N.E.R. connection at 11.38 p.m., getting back into his own bed soon after midnight. The only morning train from Carlisle direct to Euston, leaving at 8.30 a.m. (20 min. after the train he caught), would have got him to London 2 hr. after he actually arrived, and at precisely the same moment—4 p.m.—as he would need to leave Euston in order to get back to Carlisle the same night at 10.50 p.m. (or in practice usually well after 11 with this particular service). To attract passengers from the west coast of Cumberland to London and back right across the country to the Silver Jubilee is a striking tribute to L.N.E.R. enterprise; and the traveller concerned declares that his next journey will be by the same route.

VERITAS

## The Matriarch of Train Ferries

Coll-Earn, Auchterarder,
January 22

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Your editorial note on page 1052 of your December 25 issue brings back my boyhood days. I used to go down to Granton and see the trains go on and off. For tidal purposes they ran on a huge hinged ramp sloping down to the deck. This had a big gantry across it at the land end with two winches for raising it (like a drawbridge) worked by four men; and in the midst a wee cabin for the chief-in-charge who gave the word, seeing all.

We spent two holidays at Burntisland opposite Edinburgh, where I saw a boy's joyful sight. The go-on-board trains were shoved on to this hinged ramp from the rear and hauled off by a winding cable. One day the "captain" on the gantry had looked too often on the wine when it was red and saw as in a vision the mammoth vessel in place when it was not. So he signalled to the shunter afar off in the yard to shove the train on to the ramp. This done the trucks ran violently down a steep place and perished in the waters of a muddy old harbour. By bad luck I was not there. But later I got my first fright in seeing a fearsome diver's globular head with three seven-inch eyes slowly come up and then a gleeful shout. For there had been two vans in the train one carrying a grand piano and the other a load of sweeties from a wholesale maker in Kirkcaldy to Edinburgh. A steam crane's chains rattled and up came the grand piano pouring out floods of water and mud while hanging down from it were long stalactites of sugar from the sweeties, the two vans having co-mingled in the calm of the deep all in a heap.

The *Leviathan* had a larger companion (? the *Midlothian*) whom I called "the elephant," with very high paddles like big ears and four fat funnels placed four-square-wise, one in front and one behind each paddle box, giving a look of bulk plus height.

Your quotation from the *Perth Courier* of 1848 (page 1018, December 18) is of course wrong. There never was a train-ferry across the Tay. It was the above vessel (as you correctly say at page 1052) which the Napiers built. I know the present Napiers well and I thought on these things as well as of their first Atlantic steamers for the Cunard (the *Scotia* and the *Britannia*) as I stood on their yard and saw the gigantic *Queen Mary* tower over me at fishing-rod length in a narrow reach no wider than a four-track railway.

Nautically yours,
NORMAN DORAN MACDONALD

# PUBLICATIONS RECEIVED

**Rambles in Lincolnshire.** By Bernard Reeves. London: London & North Eastern Railway. 7¼ in. by 5 in. 91 pp. Illustrated. Folding map. Paper covers. Price 6d. net. **Rambles in Nottinghamshire and the Dukeries.** By Bernard Reeves. London: London & North Eastern Railway. 7¼ in. by 5 in. 88 pp. Illustrated. Folding map. Paper covers. Price 6d. net.—By the publication of such attractive little booklets as these, the L.N.E.R. has done much in recent years to encourage the rambler to discover the beauties of the Eastern Counties and other environs of the L.N.E.R. system. There can be nothing quite so disappointing as setting out unguided to explore an unknown territory of which much is expected, and then to miss all the best things. Nottinghamshire, for instance, despite its reputation as a mining and manufacturing country, is one which the rambler should not neglect, but if he wishes to avoid the mining and manufacturing areas he will do well to consult the second of these handy L.N.E.R. publications. Likewise, the stranger abroad in the flat country north of the Wash will avoid the more monotonous scenery if, before setting out, he slips "Rambles in Lincolnshire," in his pocket. Both booklets contain a dozen or so suggested rambles, illustrated with pleasing black and white sketches and route maps. A large folding map of the entire area is also included. In every case particulars are given of cheap fare facilities, as well as the appropriate reference to the L.N.E.R. timetables. The inclusion of plenty of topographical details prevents the text from becoming a mere catalogue of instructions.

**Agenda Dunod; 1937. Chemins de fer. (Dunod's Railway Handbook for 1937.)** Fifty-Sixth Edition. Edited by Pierre Place, of the Central Railway Designs Office, (O.C.E.M.). Paris, 6e: Dunod, 92, Rue Bonaparte. 5¾ in. × 3¾ in. 400 pages. Diagrams, tables, and folding chart. Price fr. 20.—The handbooks known as "Agendas Dunod" now cover 16 subjects, and some have long been appearing annually, as is the case with the volume under review, which is intended to form a technical reference book for all concerned with railways, either as engineers or operating officers. Owing to the wide sphere to be covered, the composition is varied somewhat from year to year, and the index shows in which particular issue a subject has been dealt with. Thus signalling was very fully treated in the 1930 edition, and therefore only the reforms decided on for the *Code des Signaux* of 1934, now being carried out, are dealt with in the present one. The book begins with a brief outline of the relations between the State and the various railway systems in France, followed by statistical and engineering details covering the establishment of new lines, with legislative formalities. Civil engineering works and permanent way receive fairly detailed treatment, in which foreign practice is occasionally referred to.

The technical sections cover permanent way, electrification, the locomotive (very fully treated with respect to performance data), rolling stock, and train operation. Particulars of French railcars running on January 1, 1936, are given, and the pages on operating include details of train speeds, lengths of run, and the fixing of rates and fares. Other subjects regarding which up-to-date information is presented include braking and automatic coupler systems, types of all-steel vehicles, and European electric locomotive practice. The 1937 "Agenda" is fully on a level with its predecessors and should prove useful not only to French readers but to those who follow with attention what is being done in foreign countries. A large amount of information has been collected together in it, but some details necessarily find only brief mention, a disadvantage from which all such works suffer if kept within reasonable size. The type is also very small, but the diagrams are for the most part clear.

**Historical Locomotives.** By Paul T. Warner. Illinois, U.S.A.: Strombeck-Becker Mfg. Company, Moline. 5¼ in. × 7½ in. 32 pp. Paper bound. Illustrated. Price 10 c.—Though published by the manufacturers of a line of wooden models of ancient and modern steam locomotives, and naturally intended to foster the sale of their products, this little volume is considerably more than a catalogue. Beginning with a brief introduction, treating of the basic types and designs of locomotives, the text represents a rapid survey, popular in tone, of the steam locomotive. The half-tone illustrations range in period from the British-built *Stourbridge Lion* to the *Commodore Vanderbilt* of the New York Central. Though Richard Trevithick, the Stephensons, and other early figures in English locomotive development are included, the discussion is focused largely on historic and contemporary American practice.

A note in the front of the book identifies the author as a student of and writer on locomotives, co-editor of *Baldwin Locomotives*, and for more than thirty years on the staff of the Baldwin Locomotive Works of Philadelphia, serving in the engineering and advertising departments of that company. Very likely it is this affiliation which explains the absence in the text of any mention whatever of recent diesel locomotives. Thus the little book closes modestly and hopefully with the observation: "Some people believe that the day of the steam locomotive is nearly over, but we do not think so. New designs will appear—better, faster, and more powerful locomotives than those now in service to make railroad history in generations to come."

**Snows of France.**—The extensive arrangements of the French railways for providing cheap and rapid travel to the winter sports resorts, are backed up by excellent and artistic propaganda published by themselves and by official bodies. In the latter category comes "Snows of France," an illustrated winter sports guide produced by the Centre National d'Expansion du Tourisme, du Thermalisme, et du Climatisme. As well as descriptions of the various winter sports districts, this booklet includes useful hints on clothing and equipment, advice on "what to eat at 5,000 ft., and a ski-ers vocabulary (to be learned in the train). The cover of this booklet has a roughened white surface to represent snow, and two miniature wooden skis attached in one corner which seem just to have traced a wavy track across it.

**Soot Cleaners.**—The Diamond soot cleaner, a product of the Diamond Blower Co. Ltd., Brent Crescent, North Circular Road, London, N.W.10, is in use on railways throughout the world, where its low maintenance and minimum steam consumption have earned it a high reputation. A new descriptive catalogue has now been published, showing the features of the device, which is of the back-of-firebox pattern, in a number of large and clear illustrations. A photograph is also reproduced of one of the Class 19-C 4-8-2 locomotives of the South African Railways fitted with a Diamond cleaner. The simple and rapid operation of the cleaner, coupled with its accessible mounting, is such that there is little fear of tube clearing being neglected, thus giving the assurance that heating surfaces will be maintained in their most efficient condition.

**Green Line Coaches.**—We have received from the London Passenger Transport Board a most entertaining folder, calculated to prove as intriguing as the most ingenious crossword or jig-saw puzzle. It also seems to be planned rather on the lines of a treasure hunt. The clue to all this is Irene Glen, a personified anagram of Green Line, who, with delightfully feminine inconsequential caprice, spreads the story of her day's gad about London over the whole of one side of the folder. Photographs improved with a dash of the artist's brush, two coloured impressions, a large yellow giraffe, and one small blue giraffe, illustrate the text. And then, if out of curiosity we follow through an inviting aperture in the middle of one of the coloured illustrations, we find ourselves on the other side of the folder sitting in the driver's seat of a large Green Line coach. Above us is a map of Green Line services in central London and a list of places of interest, theatres, and cinemas. Alongside is another map and a large "splodge" of red over which is printed advice as to where to alight in London. We look forward to more of this, whatever it is. Incidentally, it cannot be surrealism, because the Green Line coach is painted green.

# THE SCRAP HEAP

G.W.R. TO NOTE

The next total eclipse of the sun visible in Great Britain will occur on August 11, 1999, and will be visible from near Lands End.

* * *

"Opportunity may be a ticket for a long journey but it is generally available for the day of issue only."—*Mr. C. R. Byrom speaking at the L.M.S. Chief Operating Manager's Headquarters' Office staff dinner on January 29.*

* * *

"The nearest thing to immortality in this world is to travel by train. If you want to see the next world quickly travel by road."—*Mr. W. K. Wallace, Chief Engineer, L.M.S.R., speaking at the annual winter dinner of the Permanent Way Institution on January 30.*

* * *

CHECKING ENGINES

A book of photographs and magazine cuttings of railway engines, produced by one of two Newcastle boys summoned for railway trespass, drew high praise from the magistrates at Gateshead Juvenile Court. The boys were discharged on payment of 4s. costs each. They were caught hiding behind an engine with steam up at the engine bay at Pipewellgate adjoining the King Edward Bridge. It was explained that the boys collected railway engine numbers, and whenever they saw an engine they marked a star opposite its number in the book.—*From the "Newcastle Evening Chronicle."*

* * *

G.W.R. SHEEPDOGS

Few people have heard of railway sheepdogs, yet licences have just been taken out for 25 by the Great Western Railway, which employs them to assist the ganger in keeping clear of straying sheep certain of the valley lines in the Cardiff, Neath, Newport, and Oswestry engineering divisions of the system. The sheep descend from the surrounding hills and find their way through the fences into the railway cuttings in search of pastures new. In doing so they not only endanger their own lives but may also be the cause of delays to trains. The intelligence of the sheepdog has always been a source of world-wide admiration, but little or no praise has yet come the way of the railway sheepdog which, similarly trained by his owner, does more than round up the sheep and shepherd them through an obscure opening which he has to find; for in addition he has to acquire "track sense" and self-preservation from passing trains.

The dogs are trained to answer, from a considerable distance, commands (sometimes given in Welsh), whistles, and hand-signals of their masters, but they do not always wait to be told what to do, and often have routed the trespassers long before the ganger arrives. They are also trained to know what the warning whistle of an approaching train means. Moreover they give warning to the permanent-way men working on the line of an approaching train, and will not leave the line until all the men are clear. The track sense of these dogs is remarkable. For example, if caught between the sets of lines while driving a sheep from the running lines they will lie down until the two trains have passed. Dogs start their training at an early age, in some cases before they are six months old, and there are today quite a number of old timers who have seven, eight, or even nine years to their credit. The dogs, all mongrels of the sheepdog type, live with their masters, but the annual licence fee is paid by the company.

* * *

MORE BROADSTONE MEMORIES

It is curious how a closed station evokes sentimental regrets, whatever its associations may have been during its lifetime. The farewell to Broadstone station, Dublin, broadcast on January 18, and mentioned in our January 22 issue, has inspired a writer in *The New Statesman and Nation* to fling some scathing words at terminals on the other side of the Irish Sea, of which the only offence, as far as one can see, is that they continue to remain open. Arraigning Euston, King's Cross, and Liverpool Street, he cries: "Is it conceivable that if one of these joyless stations were closed, any sane human being would give expression to a bleeding heart in the words: 'Farewell, a long farewell to all thy greatness'" (the valedictory sentence in the Broadstone broadcast) . . . "If Charing Cross station were moved south of the Thames it would not cost me a pang. I would not care if Marylebone station were turned into a cinema." We agree, of course, that none of the terminals mentioned is likely to offer the departing traveller such a spectacle as that which greeted the writer of the article on his first journey from Broadstone, when the other occupant of his compartment was a middle-aged woman who proceeded to make tea over a spirit stove on the carriage floor. His last journey from Broadstone was equally exciting, for when some armed policemen joined the train at Athenry, the pacific conscience of the engine driver was so lacerated that he refused to budge another inch. The policemen refusing with equal pertinacity to alight, the passengers abandoned the train and proceeded to their destinations by various forms of road transport, placed at their disposal *gratis* by local sympathisers.

## One Hundred Years Ago

*Extracts from the February, 1837, issue of "The Railway Magazine" (afterwards "Herapath's Railway Journal") and the oldest constituent of THE RAILWAY GAZETTE*

*Planton's Railroad Car.*—An American has invented a car with grooved wheels to run on the rails, and independent axles to each wheel. He thinks this will obviate all the difficulties of curves, &c. We ask, what is to become of the increased friction arising from having four flanges instead of two, and how, the wheels being on independent axles, and the tyres not conical, the heavy friction in curves arising from centrifugal force is to be got rid of?

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*Snow on Railways.*—Great surprise has been manifested from the late experience on the Liverpool and Manchester, Greenwich, Whitby and Pickering, Newcastle and Carlisle, Railways, &c., that snow has formed little or no impediment to them. If we consider the great weight and momentum of the trains, with the extreme levity of the snow, we shall not be surprised at this. A passenger train is seldom less than thirty tons. Now, at a velocity of thirty miles an hour, or forty-four feet per second, it has a velocity equal to that acquired by the whole mass falling through a free space of thirty feet. Can any one for a moment suppose that a mass of thirty tons having acquired the velocity due to a height of thirty feet, or, which is nearly the same, that an iron-shell of two cwt. falling from a height of 360 yards, would find any difficulty in penetrating a 100 feet, or perhaps even a 100 yards, through snow? We have but little doubt, if the experiment could be made, that any one of the Liverpool trains would instantaneously cut itself a passage through a snow-drift of 100 feet long; but it must take care of its engine chimney and glass.

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*Railway Travelling by Wind.*—So violent was the wind on Monday last, that the Union Railway coach, between Stockton and Middlesbrough, was blown from her station all the way to Stockton (four miles) in fifteen minutes. —*From the "York Courant."*

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*Birmingham Railway.*—The Primrose-hill tunnel, which was begun about two years since, was finished on the 26th ult. It is confidently expected that the whole line of the London and Birmingham Railway will be completed early in the summer of 1838. The communication between London and Hemel Hemsted (*sic*) will be opened to the public on June 1 next, and will be continued as far as Tring before the close of the year.

# OVERSEAS RAILWAY AFFAIRS

*(From our special correspondents)*

## ARGENTINA

### Harvest Statistics

The Ministry of Agriculture has issued the following official estimate of cereal and linseed production in the 1936-37 season:—

| | Tons |
|---|---|
| Wheat ... ... ... | 6,800,000 |
| Linseed ... ... ... | 1,880,000 |
| Oats ... ... ... | 820,000 |
| Barley ... ... ... | 680,000 |
| Rye ... ... ... | 225,000 |
| Birdseed ... ... ... | 30,000 |
| Total ... ... ... | 10,435,000 |

The above total is an increase of 3,944,000 tons, or 60·8 per cent. over last year's harvest, and is higher by 721,467 tons than the average of the last 5 years, and 502,330 tons above the average of the last 10 years. It is officially estimated that, adding the carry-over as at December 15 from last year's harvest, there is an exportable surplus of 4,290,000 tons of wheat and 1,730,000 tons of linseed.

### Buenos Aires Association, Institution of Civil Engineers

The ninth annual meeting of this association was held in Buenos Aires on December 10. Mr. John H. Taylor, M.Inst.C.E., presided. The annual report showed an increase of 27 per cent. in the membership during the year. A special vote of thanks was recorded by the committee to Sir Follett Holt, K.B.E., for his donation of $1,000 Argentine paper, the interest on which is to be devoted to an award for the best contribution of the year on the design or maintenance of railway track. The following committee was elected for the ensuing year:—

Chairman: Mr. M. F. Ryan, C.B.E.; Vice-Chairmen: Messrs. W. R. J. Murray, R. Kirby, H. A. McGillycuddy, and J. H. Taylor; Members: Messrs. F. L. Creswell, J. G. Duncan G. H. Austin, J. F. Main (Hon. Sec.), F. W. Butler (Hon. Treasurer), and H. W. Stevens; Students: Messrs. G. C. Burton (Asst. Hon. Sec.), J. R. Cork, H. R. Pritchard and T. Rodgers. Representative in Uruguay: Mr. D. G. MacCormack. Honorary auditors; Messrs. J. R. Stratford Fox and R. Rowbotham.

### Locomotive Engineers at Ibicuy

The fourth and final meeting of the current session of the South American centre of the Institution of Locomotive Engineers was held on December 18 at Ibicuy, Province of Entre Rios. A party of about 50 members travelled by the Central Argentine Railway to Zárate, from which point it was conveyed by one of the Entre Rios Railways' ferry-boats to Ibicuy. On the ferry-boat a paper by Mr. E. C. Noble on "The Economics of Locomotive-Engineering" was presented and discussed. At Ibicuy, the visitors were entertained at luncheon by the management of the Entre Rios & Argentine North Eastern Railways. On the return journey the annual general meeting of the centre was held, and the work of the past year reviewed.

## SWITZERLAND

### Christmas Traffic

An increase of 8·8 per cent. in the receipts for the Christmas holiday week (December 20 to 28), as compared with 1935, is reported by the Federal Railways. During this period 487 special trains were despatched from the principal centres, viz.: Basle (140); Zurich (127); Berne (110); Lausanne (82); Geneva (16); and Lucerne (12); and 459 empty trains were run. On December 24, when the greatest number of passengers was conveyed, the four principal stations (Zurich, Basle, Berne and Lausanne) despatched 465 ordinary and 110 special trains, carrying a total of over 136,000 passengers; 204 ordinary and 42 special trains were run from Zurich alone, with some 70,000 passengers.

Nearly all the winter sports traffic was from the northern and western parts of the country to the principal Alpine districts (chiefly the Oberland, Central Switzerland, and the Grisons), there being little or no snow on the Jura range or in the less hilly parts, and short-distance traffic was therefore very small. There was a decrease in the number of travellers proceeding through Switzerland to the Tyrol.

## SOUTH AFRICA

### Overseas Railway Delegation

A delegation consisting of the following members will represent the South African Railways and Harbours at the International Railway Congress to be held in Paris from May 31 to June 12 next:—

Mr. T. H. Watermeyer, General Manager (head of delegation); Mr. W. A. J. Day, Chief Mechanical Engineer; Mr. J. M. Greathead, Assistant Chief Civil Engineer; Mr. P. D. Troskie, Chief Staff Superintendent; and Mr. T. C. Swallow, Advisory Engineer, High Commissioner's office, London.

After the congress Messrs. Day, Greathead, and Troskie will be joined by Dr. C. V. von Abo, Research Engineer, Chief Civil Engineer's Department, and Mr. D. Mackintosh, Production Engineer, Chief Mechanical Engineer's Department, for the purpose of carrying out investigations into the working of the railways in Great Britain, on the Continent of Europe, and in Amercia, with a view to applying the knowledge thus gained, where suitable, to the South African Railways, as recommended in the Granet Commission report.

### South African Airways

In addition to the six twin-engined J.U.86 machines with Rolls Royce Kestrel engines already on order, four Junkers aircraft have been ordered. All these machines are due for delivery at the end of June. Three of the four new machines will cruise at 192 m.p.h. with a full-out speed of well over 200 m.p.h. The fourth plane will be the fastest passenger machine in the Union. With ten passengers and a crew of two, it will cruise at over 200 m.p.h., and have a full-out speed of approximately 235 m.p.h. It is likely that the Cape service will be the first to be increased. From April 1 it will be thrice weekly, but the service will be gradually increased until aircraft leave Durban and Capetown daily. To synchronise with the inauguration of the flying boat service, there is also to be an aeroplane service between Johannesburg and Delagoa Bay, connecting there with the flying boats. There will also be a twice-weekly service to Lusaka.

### Vryburg-Plumtree Section

The Union Government is considering an agreement with the Government of Southern Rhodesia and the Rhodesia Railways regarding its option to purchase the Vryburg-Mafeking section of line in Union territory and the Mafeking-Plumtree section in Bechuanaland Protectorate. In the draft agreement the option is admitted by the other parties, but the Union Government binds itself not to exercise its option for 33½ years, during which period the other two parties agree to do nothing to divert important traffic from Union ports or Union port towns to Beira. The Rhodesia Railways also undertake not to increase existing rates preferences at Bulawayo in favour of Beira on traffic consigned to Bulawayo and northwards towards the Congo, and to treat the Vryburg-Ramathlabama section as though it were part of the South African Railways system in as far as purely local traffic is concerned.

## EGYPT

### Proposed Behera Relief Line

A sum of £.E.100,000 is included in the 1937-38 State Railways Budget—presumably for preliminary work—in connection with a proposed relief line from west of the Nile bridge near Tewfikieh, and paralleling the main line for about 100 km. to the suburbs of Alexandria. The section of the main line between these points is at present congested, as traffic concentrates upon it from Upper, Eastern and Central Egypt, for Alexandria.

### Helwan Line Modifications

The Railway Board has already approved in principle of the Bab El-Louk to Sayda Zenab doubling and conse-

quent station remodelling works in connection with the proposed intensified Helwan line diesel articulated service, but the Ministries of Communications and Public Works cannot agree upon the subject of underbridges. The latter wishes the line to be terminated at Madabegh or Tura and the service beyond one of those points to be continued by road. As the Minister of Communications is averse to depriving the population along the line of its present facilities, it seems likely that the line will remain as at present, without intensified service.

# DENMARK

### The Lyntog Trains

The four Lyntog units—of which three are running daily, the fourth being kept as a reserve—have provided a most satisfactory and reliable service. From May 15, 1935, when they were put into service, to May 15, 1936, they covered altogether 800,000 km., or 200,000 km. (about 124,000 miles) each. This figure may be compared with an average of 63,000 km. for a steam locomotive.

### Copenhagen Suburban Traffic

The success of the Copenhagen suburban electrification may best be seen from the growth in traffic. On all the suburban lines the number of passenger journeys during the year ended March 31, 1934, amounted to 14·2 million. In 1934-35, when the route to Klampenborg had been electrified, the figure rose to 21·3 million, and in 1935-36 further to 25·9 million. In 1936-37 the route to Holte was electrified, and for the first half of the financial year there was an increase of 2·5 million passengers.

### Introduction of Compressed Air Brake

In continuation of the information upon this subject published in THE RAILWAY GAZETTE of December 4, it may be mentioned that the position at present is as follows. The air brake is used on all diesel and petrol units and on the electric trains in the Copenhagen suburban area. About 1,150 goods wagons also are now fitted with this brake, as all vehicles going to Sweden and Germany must have the air brake used in those countries. For this reason also the Hildebrandt-Knorr type of brake has been selected for the Danish railways.

In the first stage of the programme most of the locomotives on the island of Zealand and the larger ones in Jutland will be air braked; also 100 luggage vans. The goods stock will be fitted in the proportion of one braked vehicle to three with train-pipe only. In addition more of the passenger coaches on Zealand will be equipped. It should then be possible to run through goods trains on Zealand, and some of the international passenger trains, with the compressed air brake. This stage will probably be completed in about three years.

On the passenger trains the Hardy vacuum brake is used at present, but to avoid duel fitting it has been decided to give this up. The total cost is expected to be some 12,000,000 Kr., but the actual figure is not available at present. Of this amount about half will be used for buying materials in Germany, this forming part of a trade agreement, whereby Danish goods to the same value may be exported to Germany. The other half will be used for manufacturing some of the parts and for fitting in Denmark.

The advantages of the new air brake include greater safety in the running of goods trains; a considerable saving in train staff; and raising of the speed of the goods trains from 40-45 km. p.h. (25-28 m.p.h.) to 65-70 km. (40-44 m.p.h.).

### The Storstrøm Bridge

On December 3 the last span of the Storstrøm bridge* was placed in its final position, thus uniting the islands of Masnedø and Falster. A large party was gathered on the bridge when the event took place. Amongst those present were Mr. Flensborg, Chief Engineer of the State Railways; Professor Engelund, the designer of the bridge, Mr. Ruck, chief of the Bridge Department of Dorman, Long & Co. Ltd., and Mr. Middelboe, Director of the associated Danish company.

The great floating crane *Stærkodder*, said to be the largest in the world, carried the last of the 50 spans to the site and placed it on the bearings. After Mr. Flensborg had congratulated Dorman, Long & Company on their excellent arrangements and the fine work they had performed, he and Mr. Ruck were the first to cross the completed bridge. After an inspection of the whole structure, a luncheon was given by the British firm. Mr. Ruck in a speech expressed his appreciation of the manner in which the State Railways had directed the work.

The steelwork of the bridge is now finished except for railings, &c. The remaining works include the concreting of the railway and roadway decking, platelaying, concreting the reinforced roadway slabwork, painting, &c. The earthwork in the approaches has also been completed and the concreting of the six-mile road to the bridge is now in hand. The whole work will be ready to be opened for traffic about the New Year of 1938. [See illustrations on page 241.—ED. *R.G.*]

### Improved International Service

The new diesel car service between Padburg and Frederikshavn, which was introduced in May last, has already proved a success. During the summer the service was run twice weekly, but it now runs every weekday. At Padburg the train has connection to and from Hamburg, and at Frederikshavn it connects with the Frederikshavn—Gothenburg steamer service. Consisting of a diesel-electric railcar and a bogie trailer, it has now been named Nordpilen (the Northern Arrow) and has restaurant accommodation. The service reduces the journey time between Hamburg and Frederikshavn from the previous 11 to 9½ hr. It runs from Aarhus to Padburg (the German frontier station) 137 miles in 176 min., with only a service stop at Rode-Kro (20 miles from Padburg) to pick up Customs officials. This is the longest non-stop run in Denmark.

### Half-yearly Financial Results

For the period from April 1 to September 30 the receipts from passenger traffic show an increase of 1·2 million Kr., totalling 36·4 millions against 35·2 million Kr. in the same period of 1935. The increase, which amounts to 3·4 per cent., is due mainly to the electrification of the Copenhagen suburban services and to the introduction of the fast diesel trains. Also there was a considerable improvement in goods traffic. The receipts reached 21·73 million Kr. against 20·76 millions, an increase of 4·7 per cent. In all the total receipts are shown as 64·84 million Kr. against 62·26 millions in the first half of 1935-36, an increase of 2·58 millions or 4·1 per cent.

The working expenses were 1·47 millions higher, being 56·4 million Kr., an increase mainly due to higher wages and to higher train-mileage. So the net result of working for the six months is about 1·1 million Kr. better than in the year before.

# ITALY

### State Railways Annual Report for 1935-36

The Italian State Railways administration report for the year ended June 30, 1936, shows total receipts amounting to Lire 3,339 million against 2,818 million in 1934-35, an increase of 521 million. As the total expenditure increased by only Lire 30 million, the net profit of the administration was Lire 490 million. The increase in the receipts was due mainly to trade recovery, and also, in so far as goods traffic is concerned, to the raising of tariffs on January 1, 1936. The total route kilometrage of the standard gauge system on June 30, 1936, was 16,880 km. against 16,297 km. on June 30, 1935. During the period under review the policy of entrusting to private concerns the immediate supervision and maintenance of the lines was expanded so that on June 30, 1936, direct supervision and maintenance by Government staff had ceased on 7,000 km. of line.

During the year the number of level crossings was reduced by 818, and the number of unguarded and open level crossings fell from 1,697 to 950; the number of mechanically operated crossings increased from 5,095 to 6,343, and the number of level crossings guarded

* For description see THE RAILWAY GAZETTE March 20, 1936, page 560.

by the maintenance contractors decreased from 5,228 to 3,942. The cost of maintenance of the whole standard gauge system amounted to Lire 1,196 millions, and that of the narrow gauge lines in Sicily Lire 3 million. During the period under review the doubling of 6,589 km. of line was completed while on 13,752 km. doubling works were in hand; also on 2,820 km. of line quadrupling was in progress.

[The part of the report dealing with electrification developments will be found in our *Electric Traction Supplement* accompanying this issue.—ED. *R.G.*]

### Station Flower-Gardens Competitions

Prizes to the value of 40,000 lire have been awarded during the past year to the personnel of Italian State Railways stations for the best kept flower gardens. The competitions, which hitherto have been operated on a regional basis, will henceforth be conducted nationally.

## JAPAN

### Container Traffic in Japan

Due to the marked increase in traffic resulting from the introduction of containers of very small size, viz., 2 ft. 6 in. × 1 ft. 8 in. × 2 ft. 4 in., the Japanese Government Railways are greatly extending the use of such units. Most of them are of steel, some with and some without wood lining. The tare weight is 122 lb. and the carrying capacity 330 lb. Fibreboard and bamboo containers are also being used experimentally. Of the traffic conveyed in these small units, 80 per cent. is confectionery.

## CHINA

### Railways in Chekiang Province

On the Shanghai-Hangchow-Ningpo Railway work is proceeding rapidly on the Chientang River bridge and it is expected that by June next the bridge will be completed. Work is also well in hand with the replacement of light rails by heavier track on the Chekiang-Kiangsi Railway, and it is hoped to finish the relaying by the end of June. A large station is to be built at Hangchow, which is the capital of the province of Chekiang; the Shanghai-Hangchow-Ningpo Railway and the Chekiang-Kiangsi United Railway Corporation are jointly to provide funds for the station, which is to cost approximately $1,000,000. It is expected that Hangchow will become an important traffic centre after the completion of the bridge over the Chientang River, as the above two railways will interchange traffic there, and as Provincial capital it already is a busy centre.

When the above relaying on the Chekiang-Kiangsi Railway and its extension to Pinghsiang have been completed, it is the intention to run a through express service between Shanghai and Canton. The track is being relayed on the sector between Hangchow and Yushan, a distance of 350 km. at a cost of $6,000,000, the rails being purchased on credit from Czechoslovakia, for which credit the railway will issue notes promising to pay the full amount with accrued interest within seven years under the guarantee of the Ministry of Railways.

### Railway Sleepers

A most valuable discovery of timber is reported from Szechwan, where the Provincial Department of Reconstruction has come upon a virgin forest near Ngopien estimated to contain 10,000,000 trees, many of them of a class of timber suitable for railway sleepers. If this is correct and the sleepers produced are capable of withstanding the strain of heavy loads under varying climatic conditions, it may have a marked reaction on the importation of foreign sleepers, especially those of Australian and Canadian timbers.

### Peiping-Hankow Railway

The deplorable condition of this railway, which forms part of the main trunk route from north to south, the full width of China, is to be rectified by a seven-year rehabilitation plan, to cost $22,000,000. This plan as sanctioned by the Ministry of Railways will include the rebuilding of the great Yellow River bridge at a cost of $7,500,000, as well as two other large bridges. A very large number of rotten sleepers are to be replaced, and 70 sets of points and crossings and long lengths of line are to be relaid. Workshops are to be modernised and additional rolling stock, including 20 locomotives, are to be purchased; signalling, too, is to be re-conditioned throughout. The engineering works are expected to be finished in about five years' time.

### Canton-Hankow Railway

The enquiry report upon the numerous accidents that have recently occurred on the newly-opened Canton-Hankow Railway contains recommendations which have led to decisions to take the following lines of action:—

As incompetence of some of the employees has contributed to these accidents, training classes for the staff are to be instituted. (With the opening of so considerable an additional mileage, the provision of sufficient fully-trained railwaymen has been found most difficult.)

Stringent measures are to be taken to ensure that drivers shall work strictly to signals, rules, and orders relating to speed restrictions.

Special attention is to be given to the methods of flag signalling employed near stations, and to the necessary experience required of stationmasters.

Operating lengths are to be revised and reorganised to ensure closer supervision.

It is pointed out in the report that owing to the political situation, the line was put into use long before the original time appointed, and before it was completely equipped. There was a shortage of material for telephones, and consequently communications have been adversely affected. Whilst working under these disabilities the staff has been hampered by the commandeering of trains by force, and interference with their work by the military, and this has been the direct cause of accidents on the line.

### Nanking-Kiangsi (Kiang-nan) Railway

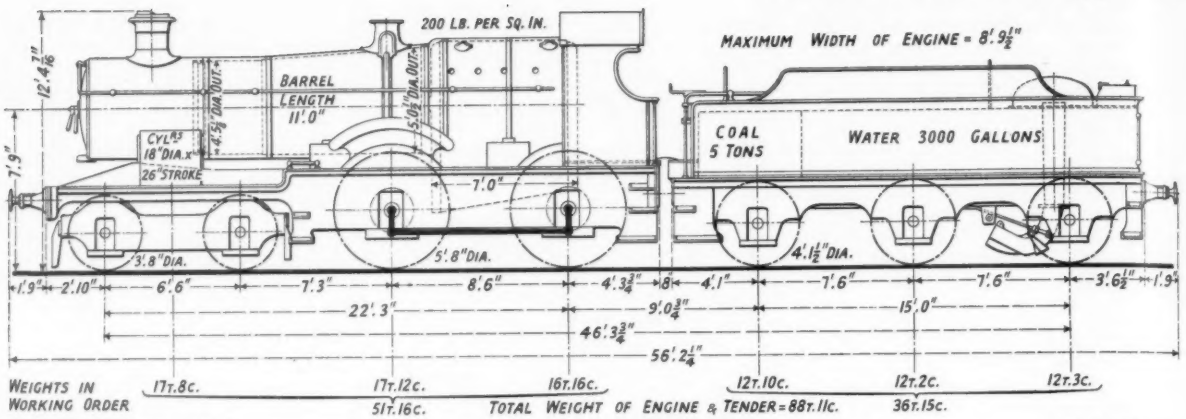
For the extension of this line southwards from Sunchiapu to Kweichi, on the Chekiang-Kiangsi Railway, a $14,000,000 loan has been floated. Construction is said to be proceeding rapidly and likely to be completed in about 12 months' time. Its completion will link up Nanking with Canton via Pinghsiang.

The Shensi Provincial Government is to finance a new railway from Hsienyang—a town on the north bank of the Wei River, a few miles north-west of Sian, and on the opposite bank to that followed by the Lung-Hai Railway—to Sanyuan, Fuping, and Yaochow, to open up a coal mining area beyond the latter town at the foot of the hills to the north. As, however, this is in the middle of the area disturbed by threatened or actual civil war, the scheme may be delayed.

### New and Future Shanghai-Nanking Express Services

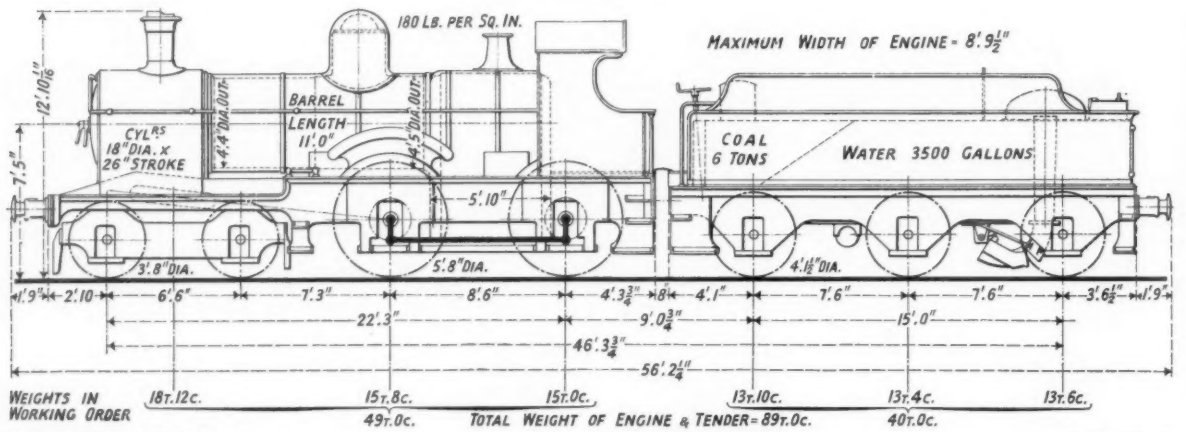
Accelerated express services were inaugurated on the Nanking-Shanghai Railway on New Year's Day. The new schedule provides for an express in each direction between Nanking and Shanghai daily; the one from Shanghai leaving at 8.0 a.m. is due at Nanking at 12.48 p.m., and calls at Soochow, Wusih, Wuchin and Chinkiang; the train in the reverse direction calls at the same stations and is booked to leave Nanking at 5.30 p.m. and reach Shanghai at 10.20 p.m. The previous timing was 5 hr. 55 min., so that the acceleration effected is 1 hr. 7 min. or nearly 20 per cent. Each train consists of a first class dining car, two second class and two third class coaches, and one composite mail-brake van. So light a train is well within the loading of the "C" class engines, but further acceleration would entail heavy expenditure on the improvement of the track, work that would take some time to carry out. However, the popularity of the new schedules already demands a more frequent service, and when the new coaching stock is delivered additional trains are to be put on. It is obvious also that train loads will have to be increased, and the new 4-8-4 Vulcan-built engines will then be requisitioned for this service. A four-hour schedule is, moreover, the aim of the Ministry of Railways, an achievement well within the capabilities of the Vulcan engines, but it will necessitate the expenditure of some $4,250,000 on permanent way for safe running at speeds averaging 60 m.p.h. between stops and speed restrictions, such as the four-hour schedule involves.

# British Locomotive Types—II



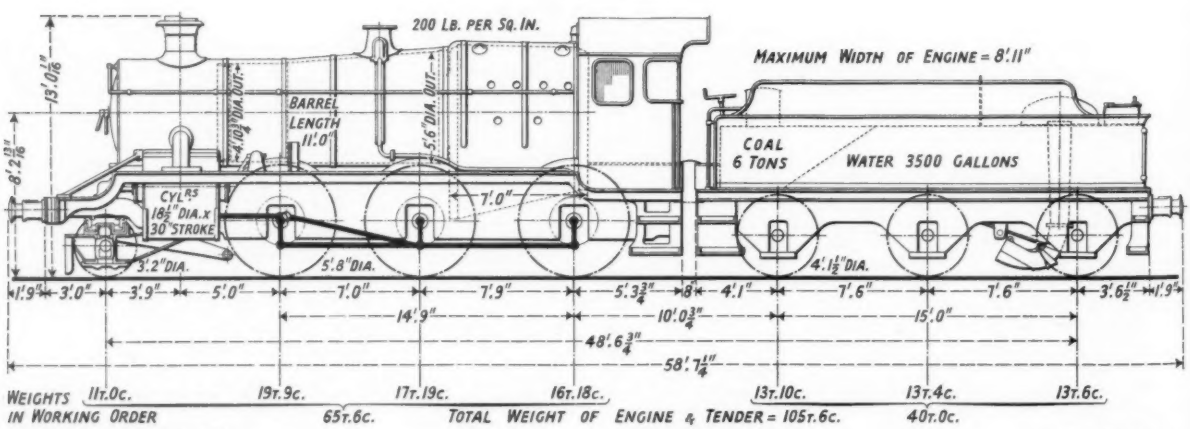

| | | | |
|---|---|---|---|
| HEATING SURFACE, TUBES— | | SUPERHEATER | 82·20 SQ. FT. |
| LARGE AND SMALL | 1,144·95 SQ. FT. | COMBINED HEATING SURFACES | 1,348·95 ,, |
| FIREBOX | 121·80 ,, | GRATE AREA | 20·35 ,, |
| TOTAL (EVAPORATIVE) | 1,266·75 ,, | TRACTIVE EFFORT (AT 85 PER CENT. B.P.) | 21,060 LB. |

"*Bulldog*" *Class*




| | | | |
|---|---|---|---|
| HEATING SURFACE, TUBES— | | SUPERHEATER | 81·25 SQ. FT. |
| LARGE AND SMALL | 1,028·95 SQ. FT. | COMBINED HEATING SURFACES | 1,224·15 ,, |
| FIREBOX | 113·95 ,, | GRATE AREA | 17·2 ,, |
| TOTAL (EVAPORATIVE) | 1,142·90 ,, | TRACTIVE EFFORT (AT 85 PER CENT. B.P.) | 18,955 LB. |

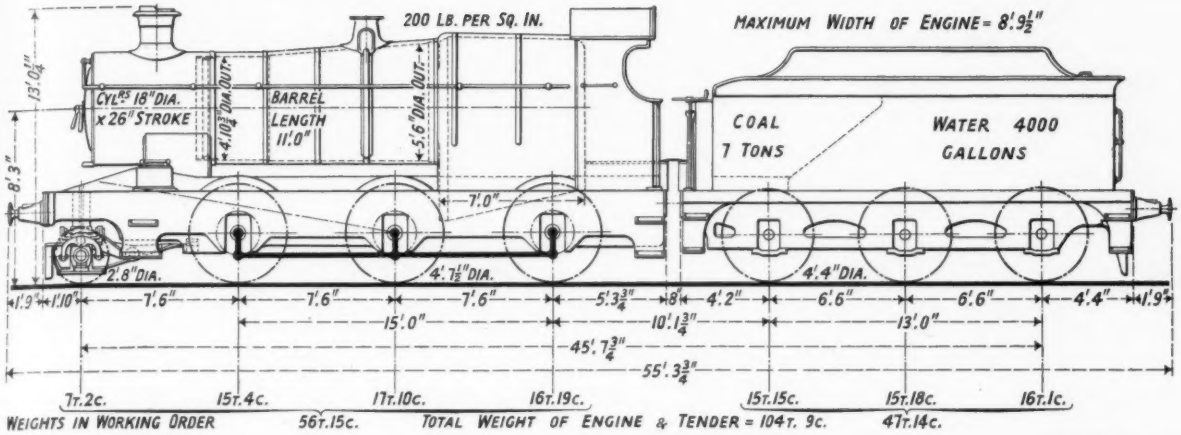
"*Earl*" *Class*




| | | | |
|---|---|---|---|
| HEATING SURFACE, TUBES— | | SUPERHEATER | 191·79 SQ. FT. |
| LARGE AND SMALL | 1,349·64 SQ. FT. | COMBINED HEATING SURFACES | 1,670·15 ,, |
| FIREBOX | 128·72 ,, | GRATE AREA | 20·56 ,, |
| TOTAL (EVAPORATIVE) | 1,478·36 ,, | TRACTIVE EFFORT (AT 85 PER CENT. B.P.) | 25,670 LB. |

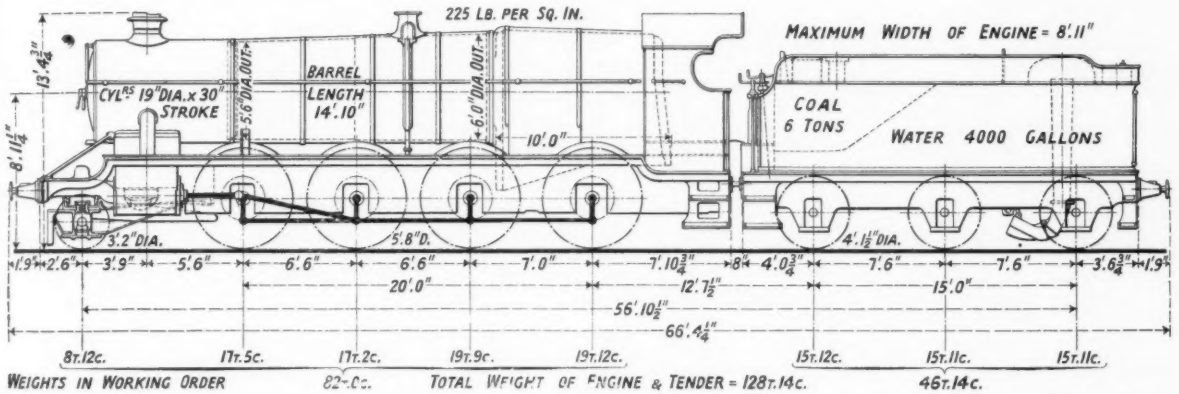
"4321" *Class*

## Great Western Railway



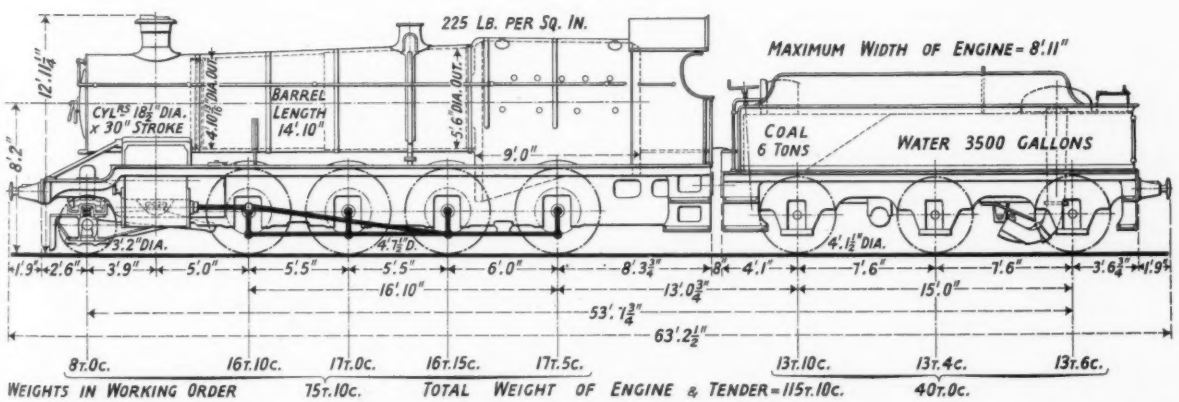

| | | | |
|---|---|---|---|
| HEATING SURFACE, TUBES— | | SUPERHEATER | 191·79 SQ. FT. |
| LARGE AND SMALL | 1,349·64 SQ. FT. | COMBINED HEATING SURFACES | 1,670·15 ,, |
| FIREBOX | 128·72 ,, | GRATE AREA | 20·56 ,, |
| TOTAL (EVAPORATIVE) | 1,478·36 ,, | TRACTIVE EFFORT (AT 85 PER CENT. B.P.) | 25,800 LB. |

"2600" *Class*




| | | | |
|---|---|---|---|
| HEATING SURFACE, TUBES— | | SUPERHEATER | 289·60 SQ. FT. |
| LARGE AND SMALL | 2,062·35 SQ. FT. | COMBINED HEATING SURFACES | 2,521·70 ,, |
| FIREBOX | 169·75 ,, | GRATE AREA | 30·28 ,, |
| TOTAL (EVAPORATIVE) | 2,232·1 ,, | TRACTIVE EFFORT (AT 85 PER CENT. B.P.) | 30,460 LB. |

"4700" *Class*




| | | | |
|---|---|---|---|
| HEATING SURFACE, TUBES— | | SUPERHEATER | 262·62 SQ. FT. |
| LARGE AND SMALL | 1,686·60 SQ. FT. | COMBINED HEATING SURFACES | 2,104·00 ,, |
| FIREBOX | 154·78 ,, | GRATE AREA | 27·07 ,, |
| TOTAL (EVAPORATIVE) | 1,841·38 ,, | TRACTIVE EFFORT (AT 85 PER CENT. B.P.) | 35,380 LB. |

"2800" *Class*

XUM

# BRITISH RAILWAY STATISTICS

*"The Railway Gazette" monthly table for Oct., 1936, as compared with Oct., 1935, compiled from the Ministry of Transport Statement No. 203*

| Description | Great Britain* | G.W.R. | L.N.E.R. | L.M.S.R. | S.R. |
|---|---|---|---|---|---|
| PASSENGER TRAIN TRAFFIC— | | | | | |
| Number of pass. journeys (ex. season ticket holders) .. | 109,382,473 | 7,765,705 | 15,643,130 | 25,524,650 | 18,456,480 |
| Increase (+) or decrease (−) .. .. | + 5,669,068 | + 394,861 | + 775,490 | + 1,657,936 | + 744,291 |
| Passenger receipts (excluding season ticket holders) .. | £4,118,754 | £535,144 | £835,608 | £1,294,327 | £849,671 |
| Increase (+) or decrease (−) .. .. | + £335,728 | + £50,928 | + £71,379 | + £118,381 | + £62,695 |
| Season ticket receipts .. .. .. .. .. | £811,302 | £50,365 | £139,976 | £215,416 | £260,992 |
| Increase (+) or decrease (−) .. .. | + £148 | − £1,639 | − £2,263 | − £4,249 | + £3,507 |
| Parcels and misc. traffic receipts (excluding parcels post) .. .. .. .. .. .. .. | £1,141,128 | £203,488 | £343,733 | £450,541 | £124,129 |
| Increase (+) or decrease (−) .. .. | + £12,658 | + £3,576 | + £413 | + £13,740 | — £3,256 |
| FREIGHT TRAIN TRAFFIC— | | | | | |
| Freight traffic (tons) (excluding free-hauled) .. .. | 22,730,526 | 5,208,596 | 10,584,659 | 10,593,535 | 1,353,108 |
| Increase (+) or decrease (−) .. .. | − 875,217 | + 113,168 | + 248,516 | + 208,556 | − 13,311 |
| Net ton-miles (excluding free-hauled) .. .. .. | 1,332,890,827 | 243,951,135 | 450,453,695 | 545,723,612 | 57,083,219 |
| Increase (+) or decrease (−) .. .. | + 48,666,579 | + 10,018,695 | + 18,146,449 | + 21,887,378 | − 1,319,959 |
| Average length of haul (miles) (excluding free-hauled) | 58·64 | 46·84 | 42·56 | 51·51 | 42·19 |
| Increase (+) or decrease (−) .. .. | + 4·24 | + 0·93 | + 0·74 | + 1·07 | − 0·55 |
| Freight traffic receipts .. .. .. .. .. | £7,402,679 | £1,309,384 | £2,390,000 | £3,070,000 | £401,346 |
| Increase (+) or decrease (−) .. .. | + £135,782 | + £83,384 | − £71,000 | + £119,000 | + £460 |
| Receipts per ton-mile .. .. .. .. .. | 1·333d. | 1·29d. | 1·27d. | 1·35d. | 1·69d. |
| Increase (+) or decrease (−) .. .. | − 0·025d. | + 0·03d. | − 0·09d. | — | + 0·04d. |
| Freight train-loads : Average train-load (tons) .. | 128·79 | 136·00 | 134·27 | 126·13 | 105·76 |
| Increase (+) or decrease (−) .. .. | − 0·72 | + 0·59 | + 0·69 | − 1·72 | − 4·69 |
| Net ton-miles— | | | | | |
| Per train engine-hour .. .. .. .. | 993·88 | 1,058·84 | 1,067·29 | 944·68 | 809·76 |
| Increase (+) or decrease (−) .. .. | − 19·35 | − 8·27 | + 17·10 | − 44·51 | − 67·73 |
| Per shunting-hour .. .. .. .. .. | 885·84 | 811·65 | 982·33 | 911·15 | 574·12 |
| Per total engine-hour .. .. .. .. | 468·38 | 459·46 | 511·52 | 463·81 | 335·94 |
| Net ton-miles per route-mile per working day .. | 2,913 | 2,842 | 3,124 | 3,439 | 1,223 |
| Increase (+) or decrease (−) .. .. | + 110 | + 114 | + 131 | + 135 | − 15 |
| Wagon-miles. Total .. .. .. .. .. | 380,473,143 | 67,934,443 | 130,941,653 | 160,806,387 | 18,595,470 |
| Increase (+) or decrease (−) .. .. | + 11,061,160 | + 2,111,551 | + 3,220,821 | + 5,457,148 | + 395,429 |
| Percentage of loaded to total .. .. .. | 67·74 | 68·90 | 65·62 | 69·00 | 67·86 |
| Wagons per train. Total .. .. .. .. | 34·79 | 35·35 | 35·03 | 34·81 | 32·44 |
| Increase (+) or decrease (−) .. .. | − 0·44 | − 0·15 | − 0·40 | − 0·65 | − 0·01 |
| Loaded .. .. .. .. .. .. .. | 23·57 | 24·36 | 22·99 | 24·02 | 22·01 |
| Empty .. .. .. .. .. .. .. | 11·22 | 10·99 | 12·04 | 10·79 | 10·43 |
| Train-miles. Coaching—Per train-hour .. .. | 15·17 | 14·08 | 14·35 | 14·45 | 17·87 |
| Per engine-hour .. .. | 12·15 | 11·21 | 11·10 | 11·06 | 14·78 |
| Train-miles. Freight—Per train-hour .. .. | 9·05 | 9·44 | 9·28 | 8·71 | 9·51 |
| Per engine-hour .. .. | 3·64 | 3·40 | 3·85 | 3·68 | 3·14 |
| Engine miles. Total .. .. .. .. .. | 47,160,708 | 7,459,332 | 13,001,453 | 17,581,350 | 6,136,638 |
| Increase (+) or decrease (−) .. .. | + 1,216,046 | + 172,332 | + 264,912 | + 618,617 | + 109,384 |
| Mileage run by engines. Total train-miles— | | | | | |
| Coaching .. .. .. .. .. .. | 22,978,282 | 3,143,879 | 5,237,345 | 7,402,091 | 4,455,585 |
| Freight .. .. .. .. .. .. .. | 10,935,520 | 1,921,919 | 3,738,042 | 4,620,018 | 573,198 |
| Engine-hours in traffic. Total .. .. .. .. | 5,100,173 | 872,899 | 1,513,478 | 2,007,054 | 503,671 |
| Increase (+) or decrease (−) .. .. | + 156,776 | + 24,828 | + 26,152 | + 93,607 | + 9,518 |
| Shunting miles per 100 train-miles— | | | | | |
| Coaching .. .. .. .. .. .. | 7·53 | 7·07 | 6·68 | 8·10 | 8·55 |
| Freight .. .. .. .. .. .. .. | 72·26 | 83·42 | 67·22 | 67·76 | 97·06 |

***Passenger Traffic Statistics: Number of journeys, receipts, and receipts per journey (excluding season ticket holders)—October, 1936***

| Subject | Great Britain | G.W.R. | L.N.E.R. | L.M.S.R. | S.R. | Cheshire Lines | Liverpool Overhead | L.P.T.B.† | Mersey |
|---|---|---|---|---|---|---|---|---|---|
| Full fares— | | | | | | | | | |
| Pass. journeys .. | 34,324,996 | 702,950 | 1,135,892 | 1,509,797 | 2,777,524 | 15,245 | 162,758 | 27,143,133 | 84,295 |
| Gross receipts .. | £918,197 | £77,054 | £130,336 | £135,285 | £189,767 | £2,591 | £1,673 | £364,991 | £1,480 |
| Receipts per pass. | 6·42d. | 26·31d. | 27·54d. | 21·51d. | 16·40d. | 40·79d. | 2·47d. | 3·23d. | 4·21d. |
| Reduced fares— | | | | | | | | | |
| Excursion and week-end— | | | | | | | | | |
| Pass. journeys | 41,913,201 | 4,582,429 | 9,509,556 | 15,206,197 | 8,748,345 | 460,021 | 84,604 | 1,510,276 | 665,826 |
| Gross receipts .. | £2,382,342 | £364,509 | £540,578 | £894,008 | £482,652 | £22,998 | £788 | £32,957 | £9,872 |
| Receipts per pass. journey | 13·64d. | 19·09d. | 13·64d. | 14·11d. | 13·24d. | 12·00d. | 2·24d. | 5·24d. | 3·56d. |
| Workmen— | | | | | | | | | |
| Pass. journeys .. | 28,946,570 | 1,943,962 | 3,908,012 | 7,566,181 | 6,171,222 | 258,420 | 232,728 | 7,653,720 | 235,382 |
| Gross receipts .. | £425,375 | £28,950 | £63,788 | £123,437 | £102,919 | £4,435 | £1,914 | £85,994 | £2,152 |
| Receipts per pass. journey | 3·53d. | 3·57d. | 3·92d. | 3·92d. | 4·00d. | 4·12d. | 1·97d. | 2·70d. | 2·19d. |
| Other— | | | | | | | | | |
| Pass. journeys .. | 4,180,254 | 532,128 | 1,085,940 | 1,234,713 | 757,857 | 35,033 | 48,646 | 401,570 | 11,932 |
| Gross receipts .. | £370,877 | £59,584 | £96,292 | £131,035 | £72,772 | £3,918 | £320 | £3,488 | £189 |
| Receipts per pass. journey | 21·29d. | 26·87d. | 21·28d. | 25·47d. | 23·05d. | 26·84d. | 1·58d. | 2·08d. | 3·80d. |
| Total— | | | | | | | | | |
| Pass. journeys .. | 109,382,473 | 7,765,705 | 15,643,130 | 25,524,650 | 18,456,480 | 768,873 | 528,736 | 36,708,699 | 997,451 |
| Gross receipts .. | £4,118,754 | £535,144 | £835,608 | £1,294,327 | £849,671 | £34,083 | £4,695 | £487,430 | £13,705 |
| Receipts per pass. | 9·04d. | 16·54d. | 12·82d. | 12·17d. | 11·05d. | 10·64d. | 2·13d. | 3·19d. | 3·30d. |

* All standard gauge railways

† Includes passengers originating on the railway undertakings, and on the Whitechapel and Bow Joint Railway

# SIGNALLING IN THE BELSIZE (PASSENGER) TUNNEL, L.M.S.R.

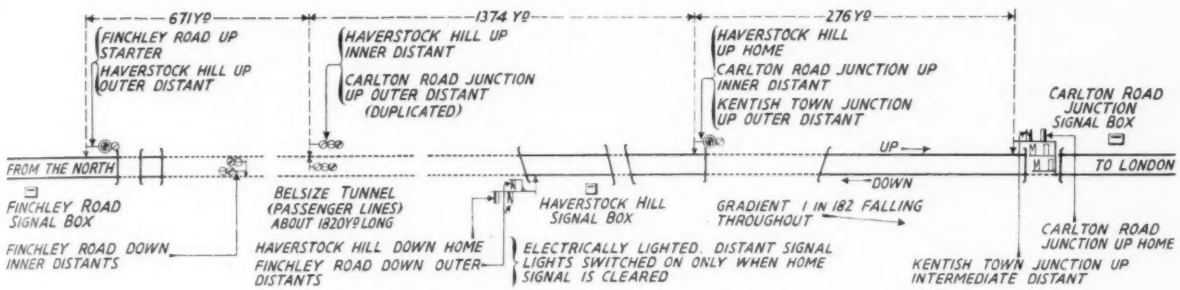
## *Mechanical signals replaced by colour-light signals to provide correct braking distance*

THE old Midland main line of the L.M.S.R. north of Kentish Town passes through a cutting and beneath several bridges, and at Haverstock Hill, where there was once a station, enters the Belsize tunnels, emerging at Finchley Road, another closed station. The goods lines use the original tunnel, constructed when the Midland was extended to London in the sixties, the passenger lines passing through the second, slightly longer tunnel, to the north of the old. Near the start of the cutting is a junction, known as Carlton Road, leading to the Tottenham and Hampstead line via the disused Highgate Road (Low Level) station.

The local conditions, often aggravated by smoke and steam, made it very difficult to place the semaphore signals where they could be readily seen, and some of those on the passenger lines have recently been replaced by colour-light signals, as shown on the accompanying diagram, worked from the signal boxes as before, the ordinary block signalling, which is of the Midland interlocking type, remaining in use. In addition to providing better indications for the drivers, especially in fog or other conditions of reduced visibility, the arrangement simplifies the slotting of the signals, enabling inner and outer distant controls, for example, to be easily effected, free from adjustment difficulties. The down home signal at Haverstock Hill, and splitting distants for Finchley Road beneath, are still semaphores but provided with Adlake electric lamps, those in the distants not being lighted until the home arm is " off."

The arrangement of the former up distant signals for Carlton Road junction was not satisfactory, necessitating a considerable reduction in the speed of trains to ensure their being obeyed when " on." To meet this difficulty the Finchley Road up starting signal now consists of a three-aspect searchlight unit and an extra yellow unit above, giving double yellow or green, as Haverstock Hill outer distant. A three-aspect multi-lens signal on the tunnel wall, with another in the 6-ft. way working with it, has replaced the old Haverstock Hill mechanical inner distant disc, and is now able to act as Carlton Road outer distant as well, displaying double yellow when " on " in that capacity. Haverstock Hill up home is of similar type to Finchley Road up starting, but serves as inner distant for Carlton Road junction and outer distant for Kentish Town junction. In this manner sufficient braking distances are provided for trains travelling on the 1 in 182 down grade into London. The conditions on the down line are much simpler, the only colour-light signals being the Finchley Road inner splitting distants, replacing the former mechanical discs in approximately the same positions in the tunnel, and each showing a yellow or green indication.

This is an interesting example of the use of multiple-aspect indications in conjunction with ordinary block signalling to provide adequate braking distances for high-speed trains. We are indebted to Mr. A. F. Bound, Signal and Telegraph Engineer, L.M.S.R., for particulars of this work.


671 YDS
1374 YDS
276 YDS
FINCHLEY ROAD UP STARTER
HAVERSTOCK HILL UP OUTER DISTANT
HAVERSTOCK HILL UP INNER DISTANT
CARLTON ROAD JUNCTION UP OUTER DISTANT (DUPLICATED)
HAVERSTOCK HILL UP HOME
CARLTON ROAD JUNCTION UP INNER DISTANT
KENTISH TOWN JUNCTION UP OUTER DISTANT
CARLTON ROAD JUNCTION SIGNAL BOX
FROM THE NORTH
UP
DOWN
TO LONDON
FINCHLEY ROAD SIGNAL BOX
BELSIZE TUNNEL (PASSENGER LINES) ABOUT 1820 YDS LONG
HAVERSTOCK HILL SIGNAL BOX
GRADIENT 1 IN 182 FALLING THROUGHOUT
FINCHLEY ROAD DOWN INNER DISTANTS
HAVERSTOCK HILL DOWN HOME
FINCHLEY ROAD DOWN OUTER DISTANTS
ELECTRICALLY LIGHTED. DISTANT SIGNAL LIGHTS SWITCHED ON ONLY WHEN HOME SIGNAL IS CLEARED
CARLTON ROAD JUNCTION UP HOME
KENTISH TOWN JUNCTION UP INTERMEDIATE DISTANT

*Arrangement of new colour-light signals in and near Belsize (passenger) tunnel, L.M.S.R.*

### Improved German Facing Point Locking

In an editorial note in our issue of February 9, 1934, we referred to the increasing use in America of an extra operating rod on long switch tongues, to obviate the risk of a tongue being brought home against the stock rail with an obstacle caught between them nearer to the heel, allowing an incorrect clear signal to be given. This is especially liable to happen with the very long tongues now being put in to allow of higher speeds through turnouts. The need for something of the kind has also been felt in Germany, where switches of 500 and 1,200 m. (547 and 1,312 yd.) radius are being installed. The new standard Reichsbahn points are provided with the claw type facing point lock, derived in principle from the old Büssing hook lock. All are trailable without damage, the switch tongues being connected, not rigidly, but through the locking gear, so that a vehicle coming from the wrong direction deflects the open tongue first far enough to unlock the closed one in time. There is a risk of this occurring too late with long and very flexible tongues, so a second, or intermediate, claw lock is fixed about half way along the points, rod-connected to the ordinary one. This not only ensures reliable trailability, but prevents the signalman bending the tongues against an obstacle and forcing the lever home without the spring clutch on the lever slipping and locking the signal levers concerned. The mechanism was described in *Das Stellwerk* for December 10 by Messrs. Herwig and Buddenberg.

# NEW 4-4-0 TYPE LOCOMOTIVES, GREAT SOUTHERN RAILWAYS, IRELAND

***Built for working heavy passenger traffic on branch lines having restricted axle loading***

THE Great Southern Railways have recently placed in service a new series of five 4-4-0 type passenger engines, designed by Mr. A. W. Harty, Chief Mechanical Engineer, and built at the company's Inchicore works, Dublin, for working heavy passenger traffic on branch lines having restricted axle loading. The engines, which are somewhat similar to those of the 337 class, have two inside cylinders and are of simple and straightforward construction. Steam distribution is effected by piston valves 8 in. diameter actuated by Stephenson link motion. In the illustration the four-wheeled bogie with outside frames and bearings will be seen; also the drive for the mechanical lubricator on the left hand side of the engine through linkage from a small return crank on the driving wheel crankpin. Lubricant is supplied under pressure to the engine axleboxes, cylinders, valves, glands, slidebars and pulling links.

The boiler barrel has a length of 10 ft. $3\frac{3}{4}$ in. and a diameter outside the largest ring of 5 ft. $2\frac{3}{4}$ in.; the firebox casing is 6 ft. $0\frac{1}{2}$ in. long, and has a width between frames of 4 ft. $5\frac{5}{8}$ in. The boiler barrel contains 24 large tubes having a diameter outside of $5\frac{1}{8}$ in., and 168 small tubes each of $1\frac{3}{4}$ in. diameter. The working pressure and heating surface figures will be found in the table opposite.

The Belpaire type firebox has mounted upon it two 3-in. diameter Ross pop safety valves. Steam sanding is applied to the front of the driving wheels, and an enclosed type cab, with side windows, is provided. The main particulars are as follow:—

| | |
|---|---|
| Cylinders, dia. | 18 in. |
| Piston stroke | 26 in. |
| Wheels, coupled, dia. | 5 ft. $8\frac{1}{2}$ in. |
| Bogie | 3 ft. 0 in. |
| Wheelbase, coupled | 9 ft. 0 in. |
| ,, engine | 22 ft. 2 in. |
| ,, total engine and tender | 43 ft. $4\frac{1}{2}$ in. |
| Heating surface— | |
| Firebox | 136·7 sq. ft. |
| Tubes | 787·7 ,, |
| Total | 924·4 ,, |
| Superheater | 329·7 ,, |
| Combined total | 1,254·1 ,, |
| Boiler pressure | 180 lb. per sq. in. |
| Grate area | 20·0 sq. ft. |

In working order the engine weighs 53 tons 3 cwt., of which 33 tons are available for adhesion. The six-wheeled tender, which has a water capacity of 3,450 gallons and a coal capacity of 7 tons, weighs in working order 35 tons, so that the engine and tender fully prepared for service together weigh 88 tons 3 cwt. The tractive force at 85 per cent. of the boiler pressure is 18,800 lb. The bogie axleboxes of one engine, and all those of one tender, have been fitted with roller bearings. The engine and tender are fitted with vacuum brake.

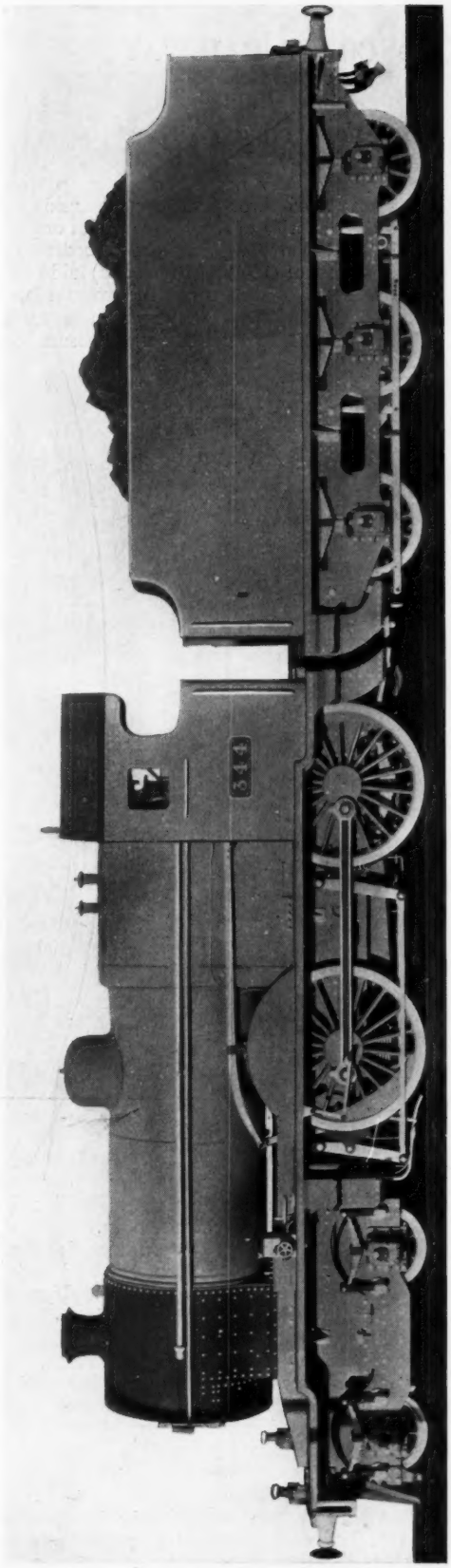
## Destruction Tests on Cast Steel Railway Wheel Centres

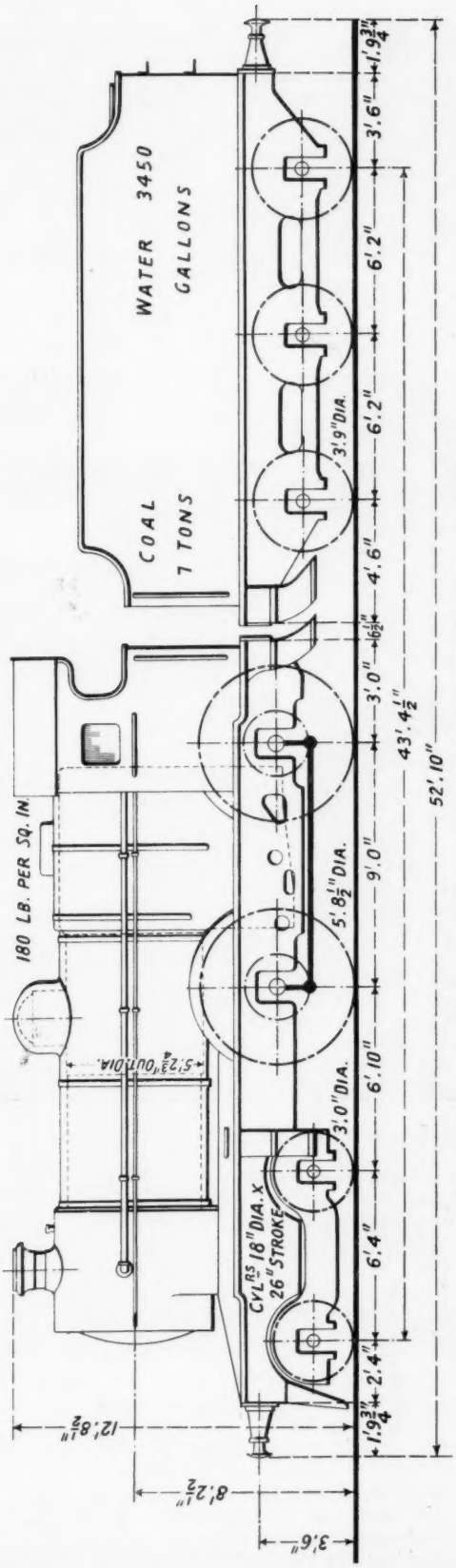
THE accompanying illustration, the original of which was taken recently at the works of Kryn & Lahy (1928) Limited, Letchworth, Herts, shows a wheel centre for a locomotive tender, one of an order for the L.M.S.R. taken after drop tests in the presence of the railway company's official inspector. The interest of the results recorded lies in the amount by which they exceed the British Standard Specification for drop-tested wheels, and the unusual ductility and soundness of the castings thereby revealed. Whereas the B.S.S. demands that the wheels shall be capable of withstanding drops of 5 ft. and 10 ft. over two spokes separated by 90 deg., the wheel in question was dropped alternately on four spots separated by 90 deg. between the spokes, on to a concrete and armour plate foundation, and the height of the drops was gradually increased up to the limit of the crane, namely, 18 ft., as follows:—

| Point No. | Height (ft.) | Point No. | Height (ft.) |
|---|---|---|---|
| 1 | 3 | 2 | 11 |
| 2 | 3 | 3 | 12 |
| 3 | 4 | 4 | 13 |
| 4 | 5 | 1 | 14 |
| 1 | 6 | 2 | 15 |
| 2 | 7 | 3 | 16 |
| 3 | 8 | 4 | 17 |
| 4 | 9 | 1 | 18 |
| 1 | 10 | | |

At the maximum height 23 further drops were made on points 1, 2, 3, and 4 (24 drops in all), and after this formidable test—causing the wheel to assume an almost square shape—no trace of fracture could be found.

*Tender wheel centre, 3 ft. 9 in. diameter, for L.M.S.R. 4-6-0 type mixed traffic engines*






TOTAL WEIGHT OF ENGINE & TENDER IN WORKING ORDER = 88T.3C.

*Side view and dimensional drawing of new 4-4-0 type passenger locomotive, Great Southern Railways, (Ireland). Designed by Mr. A. W. Harty, Chief Mechanical Engineer, and built at the Company's works, Inchicore, Dublin*

# OFFICIAL SALOONS FOR THE GOLD COAST RAILWAY

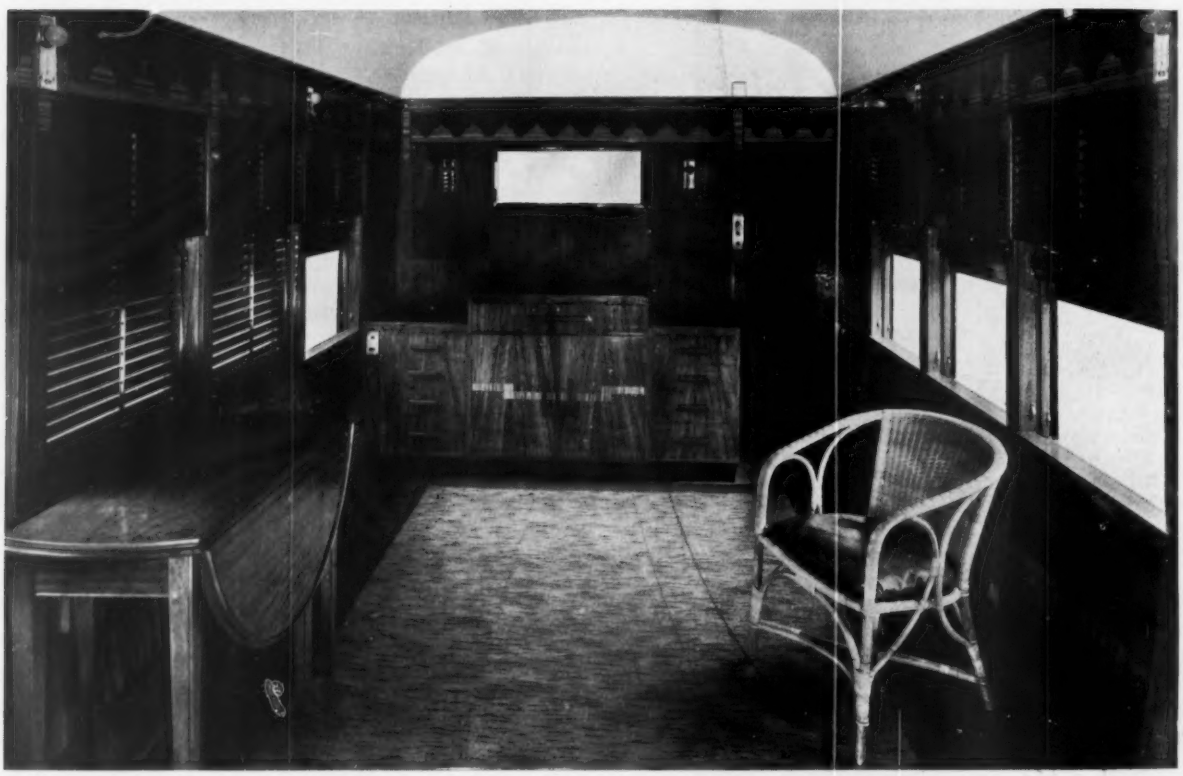
*Three Metropolitan-Cammell vehicles, providing living accommodation for officers on long tours through the country*

THE Metropolitan-Cammell Carriage & Wagon Co. Ltd. has recently completed three saloon cars for the Gold Coast Railway, built to the instructions of the Chief Engineer of the Crown Agents. These saloons are intended primarily for the use of the General Manager and other officers whose duties take them into the country for extended periods.

The bogies are the Sheffield-Twinberrow type, with 7-ft. wheelbase, and the wheels are of 2 ft. 9½ in. dia., as is the standard for all the latest carriage rolling stock built for the railway. The all-steel underframes are fitted with the railway's standard coupling and vacuum brake acting on both wheels of the bogies; a handbrake is provided at the servants' end. All-steel construction is also used for the body, which has pressed steel pillars with copper-bearing steel panels. With the elimination of sunshades full advantage was taken to increase the width of the body within the limits of the loading gauge. The result is a commodious 3-ft. 6-in. saloon, which compares favourably with standard gauge vehicles.

Special attention is paid to heat insulation; the roofs, body sides, and ends are insulated with Insulwood ½ in. thick wherever possible, with an air space for ventilation between the outside shell and the insulation. The layout of the coach consists of an observation verandah with ornamental handrailing; the main saloon; bedroom; bathroom; kitchen; and servants' sleeping compartment. Empire timber was used throughout for the inside finish and floors, and the majority of it was of African origin.

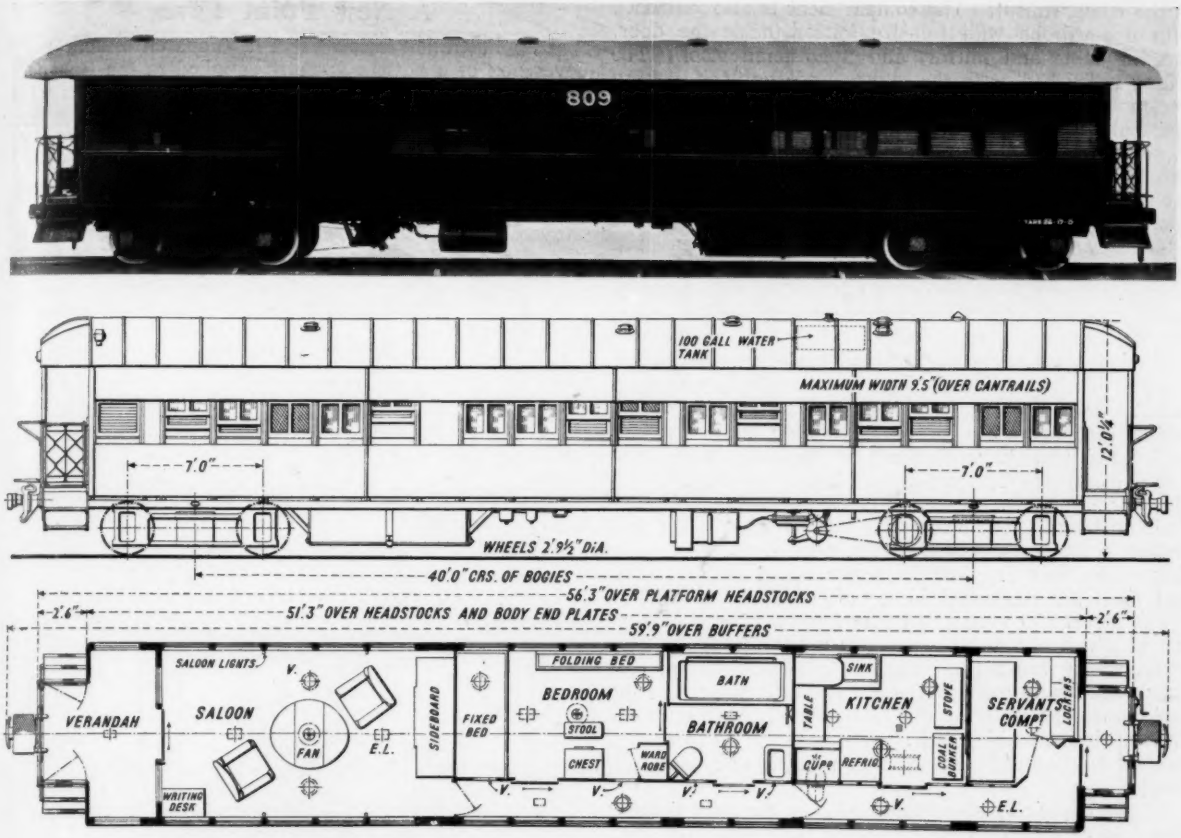
The floors in the saloon, verandah, and bedroom are composed of two layers of Odum (African oak) laid diagonally, and the remainder of the floor is Induroleum laid on galvanised keystone flooring. The verandah is panelled in solid mahogany throughout, due to its exposure to the weather, and access to the main saloon is given by a sliding door, glazed with polished plate glass. The side lights of the verandah are fitted with jalousies only.



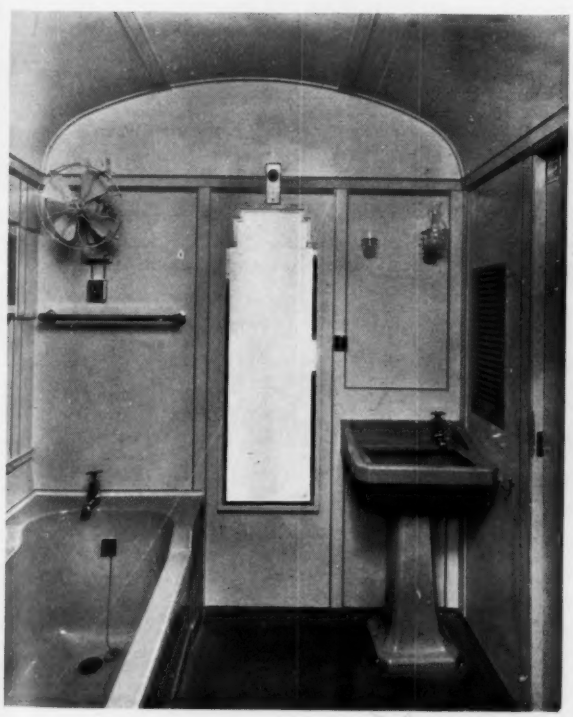
*Main compartment of one of the saloons, showing the convenient and tasteful furnishing*

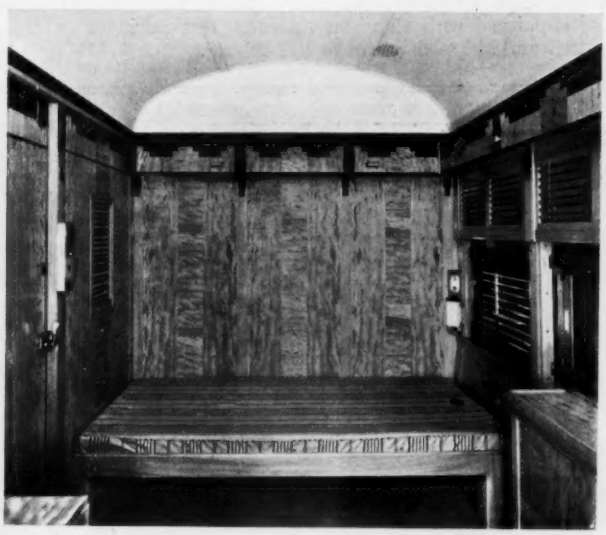
The main saloon, decorated on modern lines, is panelled throughout in African mahogany veneers, and relieved at the pilasters with Zebrano. It is conveniently furnished with sideboard, writing desk, and gateleg table. The floor is covered with green linoleum, upon which is laid a Wilton carpet of pleasing modern design in greens. Ventilation is by Monarch ventilators in the ceiling, and one 20-in. electric fan. The ceiling is Sundeala with a plain design of Lincrusta painted in two shades of pastel green. The lighting consists of two fittings in the ceiling, and eight mirror bracket lamps arranged round the frieze.

The bedroom is panelled in Avodire relieved with walnut bandings. Two beds are provided, fitted with Dunlopillo mattresses. One bed can be folded into the body side, and increases considerably the amount of room available




*General view and diagram of new Gold Coast Railway saloons*





*Above: Interior of sleeping compartment*

*Left: A view of the bathroom*

*OFFICIAL SALOONS FOR THE GOLD COAST RAILWAY*

in the compartment. The compartment is also furnished with a wardrobe with full-size mirror inside the door, dressing table and mirror, and upholstered stool. The ceiling is finished as in the saloon, and the floor is green linoleum with a green fitted mat. The side lights are identical with the saloon, and the electric lighting consists of lamps in the ceiling and berth lights. A 20-in. fan is also fitted in the ceiling, and this can be operated from each bed, or from a switch at the side of the door. A door leads out of the bedroom into the bathroom, which is finished in green, with chromium plated fittings. The floor is of green Induroleum with a mottled green rubber bath mat. A full size mirror is secured to the one partition. The ceiling is Sundeala, enamelled a light green. Ventilation is by a 12-in. fan.

The corridor leading from the main saloon to the kitchen is panelled in African mahogany, veneered and figured, and the floor is green Induroleum. The kitchen is fitted with a Griffinette coal stove and oven; hot plate rack and coal bin; and Electrolux refrigerator, paraffin operated. The remainder of the space is used for cupboards, drawers, bins for vegetables, &c., and a Monel metal sink with draining board. The cold water tank is fixed in the roof and copper pipes supply the bath, cistern, washbasin and sink. The floor is green Induroleum and the partitions and sides are enamelled in a buff shade.

The servants' compartment has three bunks, the centre one of which lets down and forms a back to the bottom bunk, which then acts as a seat. Three lockers are provided, fitted with padlocks, and a mirror is secured to the partition. The walls of the compartment are Sundeala, finished in scrumbled oak. The servants' corridor is finished in polished teak and scrumbled oak Sundeala panels.

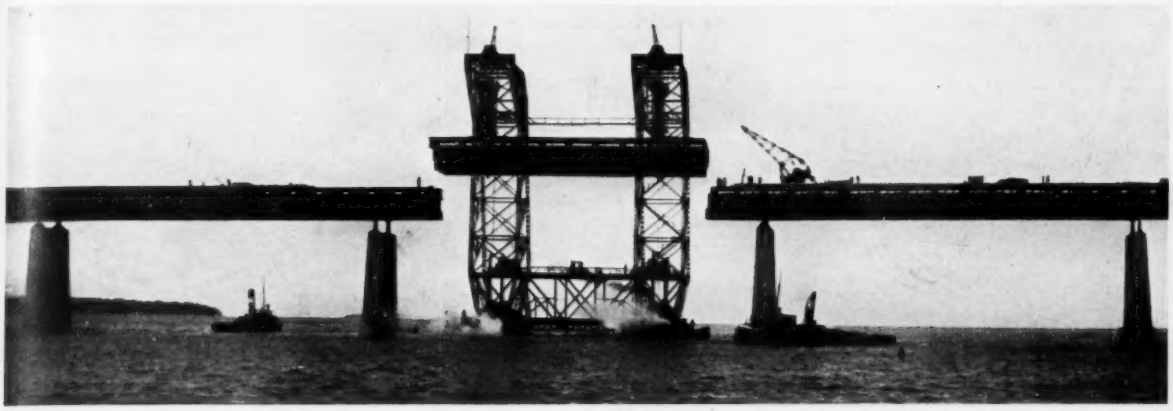
All the electric light controls, switches, &c., are situated in a box at the end of the corridor, as well as the bell, which is operated from various points in the saloon, bedroom, verandah, &c. The exterior of the coach is finished in Midland red enamel with yellow and black lining. The roof is painted with aluminium paint. The carriages were packed and shipped whole to the colony.

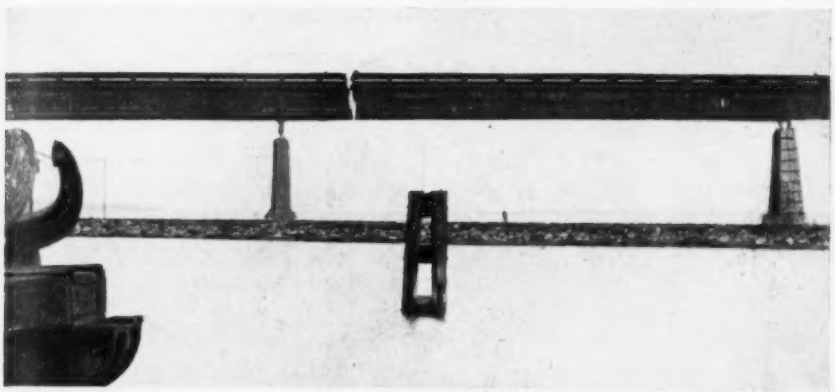
## A New Point Lever

The illustration below is of a Monarch Patent point lever box of a pattern recently supplied to the Benguella Railway to suit that company's special requirements while preserving the essential Monarch features of absolute lock and self-adjustment for wear. The unit is arranged on the bellcrank principle so that the direction of movement of the handle is parallel to the track; the more usual pattern, illustrated and described in THE RAILWAY GAZETTE of November 3, 1933, being the direct-throw type in which the direction of movement of the handle is at right angles to the track. The unit is made by the Monarch Controller Co. Ltd., 7, Victoria Street, Westminster, which has recently received from a home railway an expression of satisfaction with the direct-throw type after an extended period of trial.

*Interior of a modern German high-speed diesel railcar* (*see editorial note on page* 222)

# The Storstrøm Bridge, Danish State Railways



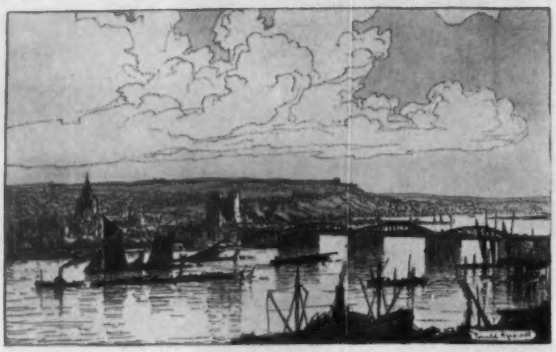


*On December 3, the last span of the Storstrøm bridge was placed in position, as recorded in our Overseas columns on page 230. The illustration above depicts the great floating crane "Stærkodder" in the act of placing it on its bearings. The picture on the left gives a remarkable view of the ends of a cantilevered and suspended span. The photograph was taken on a cold day when the expansion gap was wide. The whiteness of the new cast steel bearing piece completes the illusion of a break*

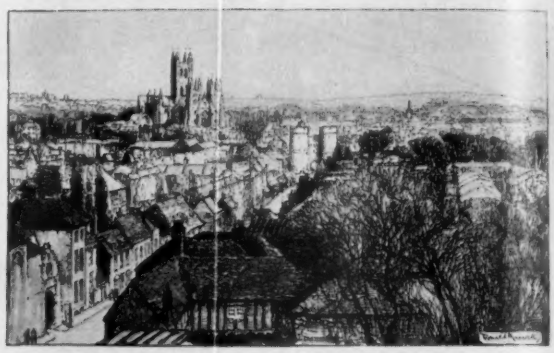
*Two views of the seating accommodation in a new Czechoslovak railcar (see editorial note on page 222), the appointments of which have been designed by a specialist in interior decoration*

# Coloured Etchings for Southern Railway Carriages

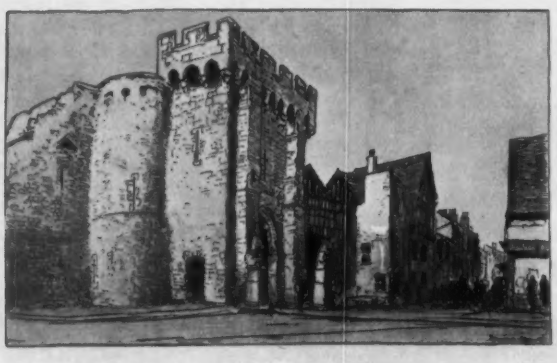
(*See editorial note on page* 222)



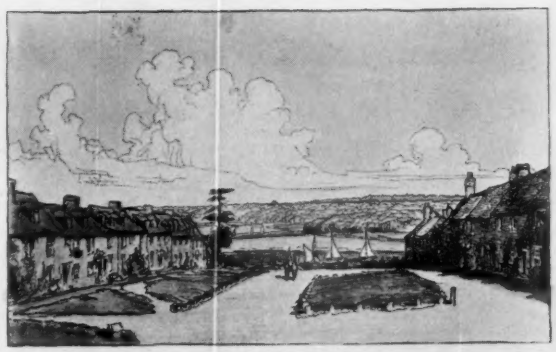
*Rochester, Kent*



*Canterbury Cathedral*

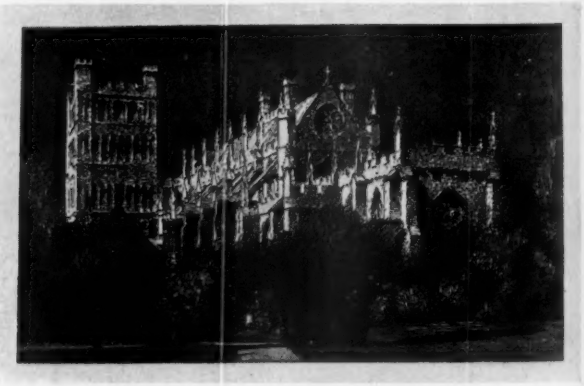


*Southampton Bargate*



*Bucklers Hard, Beaulieu*

*Winchester Cathedral*



*Exeter Cathedral*

# RAILWAY NEWS SECTION

## PERSONAL

NEW YEAR HONOURS

*Viscount*

The Rt. Hon. Hamar, Baron Greenwood, K.C., Chairman of Dorman, Long & Co. Ltd.

*Baron*

Sir Harry Duncan McGowan, K.B.E., LL.D., Chairman, Imperial Chemical Industries Limited.

*Knights Bachelor*

Mr. Amos Lowrey Ayre, O.B.E., J.P., Member of the Railway Staff National Tribunal.

Mr. Panambur Raghavendra Rau, Financial Commissioner of Railways, India.

Mr. William Biggart Lang, J.P., President, Machine Tool Trades Association.

*C.B. (Civil Division)*

Mr. Frederick Charles Cook, D.S.O., M.C., M.Inst.C.E., F.S.I., Chief Engineer, Roads Department, Ministry of Transport.

*K.C.V.O.*

Mr. Walter Turner Monckton, M.C., K.C.

*C.V.O.*

Lieut.-Colonel Edwin Charles Cox, C.B.E., M.V.O., lately Traffic Manager, Southern Railway.

*K.B.E. (Civil Division)*

The Hon. Herbert Sydney Hudd, M.C., Commissioner of Public Works, Minister of Railways, and Minister of Marine, State of South Australia.

*C.B.E. (Civil Division)*

Mr. Clement Gilman, M.S.A.Soc.C.E., Chief Engineer, Railways, Tanganyika Territory.

Mr. Arthur Edward Hamp, M.Inst.C.E,. Chief Engineer, Kenya & Uganda Railways & Harbours.

Commander Richard John Bayntun Hippisley, O.B.E., T.D., M.I.E.E., J.P., D.L. (late R.N.V.R.), Area Traffic Commissioner, Western Area.

*O.B.E. (Military Division)*

Lieut.-Colonel (Hon. Colonel) John Archibald Polwhele, V.D., General List, Auxiliary Force, India. He is Manager and Engineer-in-Chief of the Bengal Dooars Railway.

*O.B.E. (Civil Division)*

Mr. Frank Edward Mamertus Beatley, General Manager and Traffic Manager, Sierra Leone Govt. Railways.

Mr. William McKenzie Mather, Private Secretary to the High Commissioner for India in London.

Mr. William Alfred Pickwoad, General Manager (Bolivian Section), Antofagasta (Chili) & Bolivia Railway.

Mr. Hubert Kenneth Purcell, Head of the General Department and Chief Clerk, Crown Agents for the Colonies.

*M.B.E. (Civil Division)*

Mr. Samuel Abda Collins, Station and Yardmaster, Haifa, Palestine.

Mr. Seddie Symons, Staff Officer, Grade II, Ministry of Transport.

Mr. Henry Charles Webster, Ferry Superintendent, East Indian Railway.

*British Empire Medal (Civil Division)*

Mr. Salem Kirry, Stationmaster, Tulkarm, Palestine Railways.

***Mr. H. A. Alexander,***

Appointed Divisional Engineer, Bristol, G.W.R.

***Mr. E. T. Davies, M.C.,***

Appointed Divisional Engineer, Taunton, G.W.R.

Mr. H. A. Alexander, A.M.Inst.C.E., who, as announced in our issue of January 29, has been appointed Divisional Engineer, Bristol, G.W.R., on the retirement of Mr. S. W. Moore, the present Divisional Engineer, on June 16 next, joined the staff of the Chief Engineer in 1899. From 1905 to 1910 he acted as Assistant to the Resident Engineers on the construction of the Acton and High Wycombe and the Birmingham and North Warwickshire lines, Birmingham (Snow Hill) station, and widenings to the north and south of that centre. In 1915 Mr. Alexander's services were lent to the War Office, and in 1917 he went to France as Captain in the Royal Engineers. He was appointed Staff Major in 1919, and was mentioned in despatches. Demobilised in 1920, he was appointed Resident Engineer in charge of the Falmouth branch deviations in 1921, and the following year was Resident Engineer of the Clydach, Pontardawe and Cwmgorse Railway, and also for the River Neath bridge at Glyn Neath. In 1924 he was appointed Assistant Divisional Engineer at Gloucester, and in 1926 was transferred to Neath in a similar capacity. In 1927 he accompanied Mr. Carpmael when he went to the United States to inspect and report on the maintenance of American railways. In May, 1931, Mr. Alexander was selected for the position of Divisional Engineer for the Central Wales Division, and in 1932 was transferred to Taunton, in a similar capacity, whence he will proceed to Bristol in June. He is an Associate Member of the Institution of Civil Engineers and a Fellow of the Permanent Way Institution.

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Mr. E. T. Davies, M.C., A.M.Inst.C.E., who, as announced in our issue of January 29, has been appointed Divisional Engineer at Taunton, G.W.R., received his technical training at the University College of South Wales, Cardiff, and as articled pupil to the former Chief Engineer of the Taff Vale Railway. In 1915 he joined H.M. Forces, and, whilst serving with a Field Company, R.E., in France and Belgium, was awarded the Military Cross in 1917, and a bar a year later. He was demobilised with the rank of Captain, and rejoined the Taff Vale Railway as Assistant. Prior to the amalgamation of the railways, Mr. Davies was employed chiefly on the design and erection of bridges, and on his transfer to the G.W.R., was appointed to the Central Wales Division, where he was in charge of some of the larger constructional works then in progress. He was transferred to London in 1925 as Assistant to the Divisional Engineer. In January, 1927, he was appointed Assistant Divisional Engineer at Gloucester, and in 1932

returned to the London Division in that capacity. He was appointed in 1934 Assistant in the Chief Engineer's

*Mr. E. J. Stephens,*

Appointed District Superintendent, Lincoln, L.N.E.R.

office, and last year became General Assistant. This position he vacates in June to take on his new duties as Divisional Engineer at Taunton. Mr. Davies assisted in the formation of the Supplementary Reserve, R.E., and was one of the original officers. At one time he commanded No. 1 Railway Bridging Company, now 152nd (G.W.) Railway Construction Company, and was Co-ordination Officer between the four Great Western companies and the War Office. He is a Major in the Regular Army Reserve of Officers, R.E.

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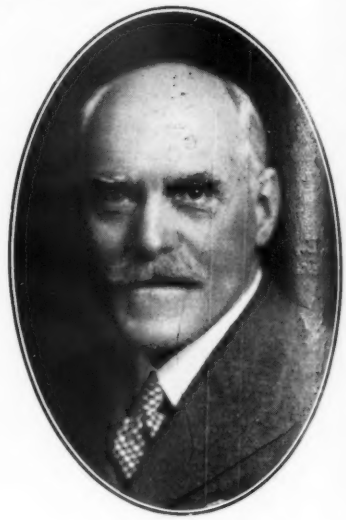
Mr. E. J Stephens, who, as announced in THE RAILWAY GAZETTE of January 22, has been appointed to succeed Mr. G. Sutcliffe as District Superintendent, Lincoln, L.N.E.R., joined the former North Eastern Railway at York in 1922, and was first employed in the Goods Manager's office. After 18 months he was transferred to the Operating Department of the L.N.E.R., where he gained experience at the West Hartlepool Docks and in the York, Darlington and Hull Districts. Meanwhile Mr. Stephens had, for a time, been on the Divisional General Manager's staff at York in connection with the organisation of the railway centenary celebrations. In 1926 he was transferred to the Southern Area as Assistant Yardmaster, Doncaster, and four years later became Yardmaster at Wath, where he remained until promoted to be Assistant District Superintendent at Doncaster in 1932, the position he now vacates to go to Lincoln as District Superintendent. During the war Mr. Stephens saw service in Palestine with the Special Reserve of the R.F.A.



*Mr. A. M. Dennis,*

Chief of the Continental Goods Department, S.E. & C. and Southern Railways, 1899–1936

On December 31 last Mr. A. M. Dennis, M.Inst.T., Chief of the Continental Goods Department, Southern Railway, retired after over 51 years' of

*Back Row (left to right).*—Mr. J. I. Pearse (G.I.P.R.), Mr. A. J. F. Millar (S.I.R.), Mr. P. Wood (G.I.P.R.), Mr. T. Stephenson (M. & S.M.R.), Mr. T. Christian (I.R.C.A.), Mr. E. E. C. Price (J.R.), Mr. D. Y. Anderson (Martin & Co.), Mr. J. Fearfield (B.S.R.), Mr. F. R. Hawkes (N.W.R.), Mr. S. Simpson (N.W.R.), Mr. H. D. Sinclair (M.R.), Mr. P. R. Leigh-Bennett (B.N.R.), Mr. J. H. F. Raper (G.I.P.R.).

*Second Row.*—Mr. S. S. Stubbs (I.R.C.A.), Mr. D. B. Bhatt (B.S.R.), Mr. S. R. Phansey (Dh.S.R.), Mr. Govindaraja Pillai (S.I.R.), Mr. R. S. Girdharlal D. Mehta (G.R.), Mr. K. S. M. A. Rashid (G.B.S.R.), Mr. L. N. Flatt (N.W.R.), Mr. H. D. Furley (N.W.R.), Mr. R. de K. Maynard (M. & S.M.R.), Mr. J. C. Barrack (R. & K.R.), Mr. A. Mair (B.D.R.), Mr. R. Hannay (B. & N.W.R.), Mr. A. A. Brown (B.B. & C.I.R.).

*Third Row.*—Mr. R. G. Manson (A.-B.R.), Mr. W. H. H. Young (E.I.R.), Mr. E. J. Hope (G.I.R.), Mr. G. D. Moore (B.B. & C.I.R.), Mr. L. W. van Someren (E.B.R.), Mr. F. H. Bibra (B.S.R.), Mr. N. R. Green (M.R.), Mr. M. H. Irens (U.C.R.), Mr. G. W. N. Rose (J.S.R.), Mr. A. P. Roy, (McLeod & Co.), Major G. F. Evans (J.R.), Mr. R. W. F. Butterfield (B.B. & C.I.R.), Mr. D. Baker (B. & N.W.R.), Mr. B. Lawrence (I.R.C.A.).

*Front Row (sitting).*—Mr. R. T. Power (Burma R.), Mr. D. M. S. Robertson (E.I.R.), Mr. K. V. Iyer (M. & S.M.R.), Mr. A. F. Harvey (E.B.R.), Mr. C. A. Muirhead (S.I.R.), Sir Maurice Brayshay (B.B. & C.I.R.), Mr. H. N. Colam (M. & S.M.R., President), Mr. L. Wilson (G.I.P.R.), Lt.-Col. C. F. Carson (N.W.R.), Mr. J. D. Westwood (B. & N.W.R.), Mr. G. E. Cuffe (A.-B.R.), Major E. W. Slaughter (H.E.H. the N.S.R.), Mr. E. C. J. Gahan (B.-N.R.).

***The 35th session of the Indian Railway Conference Association, Delhi, November, 1936***

*On page 224 will be found an editorial upon the presidential address by Mr. Colam at this session of the I.R.C.A.*

continuous railway service. Mr. Dennis began his career as a clerk at Faygate station, L.B.S.C.R., in August, 1885, and was transferred to Kemp Town (Brighton) in 1887. In February, 1889, he joined the Continental Traffic Manager's office of the former London Chatham & Dover Railway, under the late Sir William Forbes, and at the formation of the South Eastern and Chatham Railway Company's Managing Committee, became Chief of the Continental Goods Department, continuing in that post when the Southern Railway was formed, and for 37 years in all until his retirement. Mr. Dennis has had a very wide experience in all matters appertaining to transport of Continental merchandise, and during recent years the international situation, tariff barriers, &c., have increased the difficulties of his task; he also dealt with Channel Islands merchandise traffic. He is a founding member of the Institute of Transport. The French Government conferred upon him the Croix de Mérite Agricole for services rendered to France in the development of fruit and vegetable traffic with England, and also gave him a diploma for his services in regard to transport of French Red Cross goods between England and France during the war. Mr. Dennis is held in the highest esteem by his colleagues and staff and wide circle of business friends, and he has been the recipient of many tokens of good wishes, including an inscribed gold half-hunter watch from the staff of the Continental Department of the Southern Railway, and a silver salver, suitably inscribed, from the principal shipping and forwarding agents, who entertained him to luncheon recently.

### Presentation to Mr. C. J. Brown

On January 29 at a luncheon at Liverpool Street, Mr. C. H. Newton, Divisional General Manager, on behalf of the Officers' Mess, presented Mr. C. J. Brown with a mahogany knee desk on his retirement from the position of Engineer of the Southern Area, L.N.E.R. After referring to Mr. Brown's long and distinguished career in the world of railway engineering and the valuable work he had done first in the service of constituent companies and later in that of the L.N.E.R., Mr. Newton expressed the wishes of all present that Mr. Brown might enjoy a full measure of health and happiness in the years of leisure he had so amply earned. Mr. Brown expressed his gratitude for the presentation and the expressions of goodwill extended to him, and stated how fully he had enjoyed his life on the railway notwithstanding the pressure of work which had latterly grown so acute. He also said that he looked forward to many occasions in the future when it would be possible to renew old friendships and his association with the representatives of other departments whose helpful co-operation had always been so much appreciated by him.

Sir Josiah Stamp, Chairman and President of the Executive, L.M.S.R., has been elected President of the Institute of Public Administration, in succession to Sir Austen Chamberlain.

### Institution of Civil Engineers

Mr. John Taylor Thompson, M.C., Assistant Engineer, North Eastern Area, L.N.E.R., has been transferred from the class of associate member to that of full member.

At a meeting of the Committee held at the Irish Railway Clearing House on January 27, Sir Walter Nugent, Bart., Chairman of the Great Southern Railways, was unanimously elected Chairman of the Irish Railway Clearing House for the current year.

### Transport Advisory Council

Sir James Milne, K.C.V.O., C.S.I., and Sir Josiah Stamp, G.C.B., G.B.E., have been re-elected as members, and Sir Ralph Wedgwood, C.B., C.M.G., has been elected a member (in place of Sir Herbert Walker) as representing railway interests on the Transport Advisory Council, constituted under the Road and Rail Traffic Act, 1933.

Sir James Williamson has been appointed Managing Director of the Bengal & North Western Railway, as from February 2, in place of Lt.-Col. W. R. Izat, D.S.O., R.E. (Ret.), who retains his seat on the board of the company.

Sir James Williamson has also been appointed Secretary of the Rohilkund & Kumaon Railway vice Col. Izat and as from the above date.

Dr. Julius Dorpmüller, General Manager and Chairman of the German State Railway Company, has been appointed to fill the new post of Minister of Transport, formed as a result of the division of the Ministry of Posts and Transport into two separate Ministries. He will, however, continue to act as General Manager and Chairman of the Reichsbahn until the details of the new status and organisation of the system—outlined in Herr Hitler's speech last Saturday—have been worked out. An editorial note on page 222 deals with these changes.

We regret to record the death of Mr. H. M. Ingledew, sometime Solicitor to the Taff Vale Railway. Educated at King Edward's School and Merton College, Oxford, he was admitted as a solicitor in 1890, and, on the death of his father, succeeded him as Solicitor to the Taff Vale Railway, in which work he had specialised. He became well known in 1901 when, as a result of his advice, an action was begun by the company which led to the famous Taff Vale judgment of the House of Lords, making possible the suing of the Amalgamated Society of Railway Servants for damages caused by enticement to strike action without notice; a judgment that led to the passing of the Trades Disputes Act of 1906. Mr. Ingledew was a Knight of Justice of the Order of St. John of Jerusalem.

### Indian Railway Staff Change

Mr. J. W. Ogle has been appointed to officiate as Deputy Chief Operating Superintendent (M), N.W.R.

The Crown Agents for the Colonies have recently appointed Mr. E. M. Bland to be Engineer, Government Railway Investigation, Barbados and British Honduras.

### L.N.E.R. Appointments

The London & North Eastern Railway announces the following appointments:—

Capt. H. J. Perry, Assistant to the Marine Superintendent, Parkeston Quay, to be Assistant Marine Superintendent, Glasgow.

Mr. J. H. McIlvenna, District Engineer, Hull, to be District Engineer, Darlington, in succession to Mr. J. T. Thompson, recently appointed Assistant Engineer, North Eastern Area.

Mr. F. H. Colebrook, Assistant District Engineer, Newcastle, to be District Engineer, Hull, in succession to Mr. J. H. McIlvenna.

Mr. J. I. Campbell, Chief Assistant, District Engineer's office, Guide Bridge, to be District Engineer, Boston, in succession to Mr. G. B. Barton, recently appointed Assistant to Engineer (Maintenance), Southern Area.

Mr. C. P. Parker, Chief Assistant to District Engineer, Stratford, to be District Engineer, Cambridge, in succession to Mr. B. P. Fletcher, recently appointed District Engineer, Stratford.

Mr. R. C. Rattray, District Engineer, Southern District, Carlisle, to be District Engineer, Western District, Glasgow, in succession to Mr. W. Y. Sandeman, recently appointed Assistant to the Engineer (General), Southern Area.

Mr. G. S. Inglis, Chief Assistant (Construction), Engineer's office, Edinburgh, to be District Engineer, Southern District, Carlisle, in succession to Mr. R. C. Rattray.

Mr. M. A. Cameron, Assistant District Passenger Manager, London, to be District Passenger Manager, Leeds, in succession to Mr. J. P. Allix, recently appointed District Goods and Passenger Manager, Cambridge.

Canadian Pacific Earnings.—Gross earnings of the Canadian Pacific Railway for the month of December, 1936, amounted to $12,253,000, an increase of $672,000 in comparison with December, 1935. In the working expenses of $8,711,000 there was an increase of $436,000, leaving net earnings $236,000 higher, at $3,542,000. Aggregate gross earnings for the twelve months of 1936 were $138,563,000, an improvement of $8,884,000, and the net earnings of $23,311,000 were higher by $913,000.

# Freight Terminal Improvements, L.M.S.R.

## Modernisation Schemes at Derby, Coventry and Manchester

Three important schemes for the modernisation and extension of goods terminal facilities at Manchester (Ancoats), Coventry, and Derby are to be carried out by the L.M.S.R. in order to provide improved methods of handling goods and quicker transits of freight, and to allow for the growth in traffic arising from the expansion in trade. A feature of all these schemes is the introduction of electrically-driven machinery for use in connection with the unloading of wagons, in conjunction with other new equipment and methods of the latest type.

### New Midland Freight Centre at Derby

At Derby (St. Mary's) it is intended to erect on vacant land belonging to the railway company a large new goods shed capable of handling some 900 tons of freight traffic daily, including considerable railway transhipment traffic as well as traffic collected or delivered by road from or to the town of Derby itself. This new Midland freight centre will not only provide more efficient working at Derby itself, but will also ease the traffic position at other places, including Leicester, Nottingham and Birmingham. When it is in operation it will despatch some 375 wagons of outwards traffic daily, to 178 different destinations.

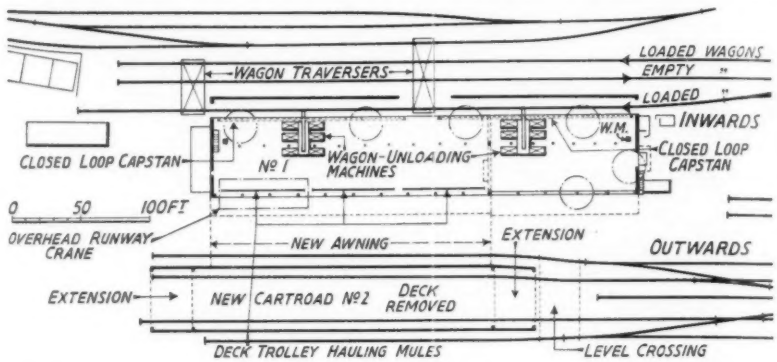
The new shed will have standing room for 180 rail wagons inside and for nearly 600 wagons in the approach sidings, apart from outside wagon accommodation for dealing with full-load traffic. In consequence of the additional traffic to be handled at the new shed, two extra shunting sidings will also be installed at Chaddesden sorting sidings, Derby.

Modern methods of loading and unloading traffic will be used, incoming wagons being moved into position and afterwards moved away empty by means of a new and original type of capstan and traversers. For the actual unloading from wagons, specially designed wagon-unloading machines will be used, whence the goods will be distributed to the town cartage vehicles or transhipment wagons by a fleet of thirty-two large horse-drawn sorting drays. These drays will have a new type of shaft with automatic couplings.

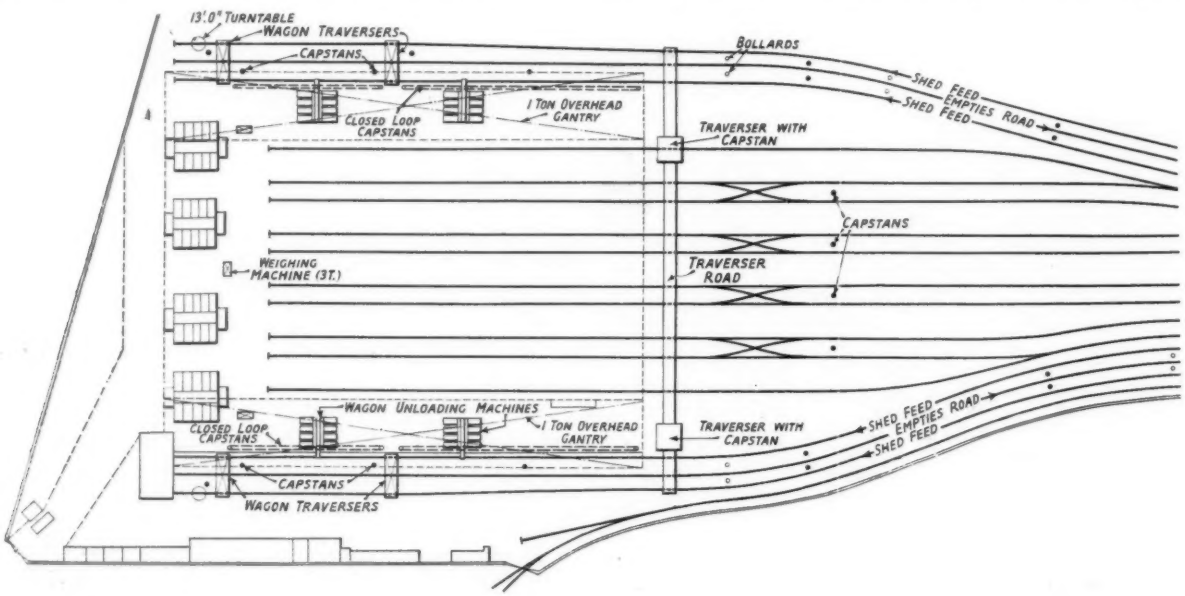
Owing to the geographical situation of Derby and the numerous important lines radiating from it in all directions it will be possible, with the new accommodation to reduce the transit time of hundreds of thousands of consignments per annum. After the new shed is brought into use, the existing goods sheds at Derby will be utilised for warehouse accommodation.

### Improvements at Coventry

At Coventry, where an average of over 100 wagons of miscellaneous traffic are received daily, and where the volume of traffic to be dealt with is rapidly increasing, the goods shed buildings are being entirely reconstructed and the layout remodelled in order to permit of the installation of wagon-unloading machines and other new equipment. Instead of dealing with both outwards and inwards traffic through the same shed, they will be separated, and while the inwards traffic will be dealt with by means of the wagon-unloading machines, being con-




*New arrangement of goods depot at Coventry showing wagon-unloading machines and positions taken up by deck trolleys for transferring goods across the deck to town drays*




*New layout for depot at Derby showing position of four wagon-unloading machines and arrangements for transferring goods therefrom to town drays*

veyed thence to road vehicles by a fleet of 40 six-wheel trolleys hauled by petrol tractors, outwards traffic will be loaded under cover direct from road to rail vehicles.

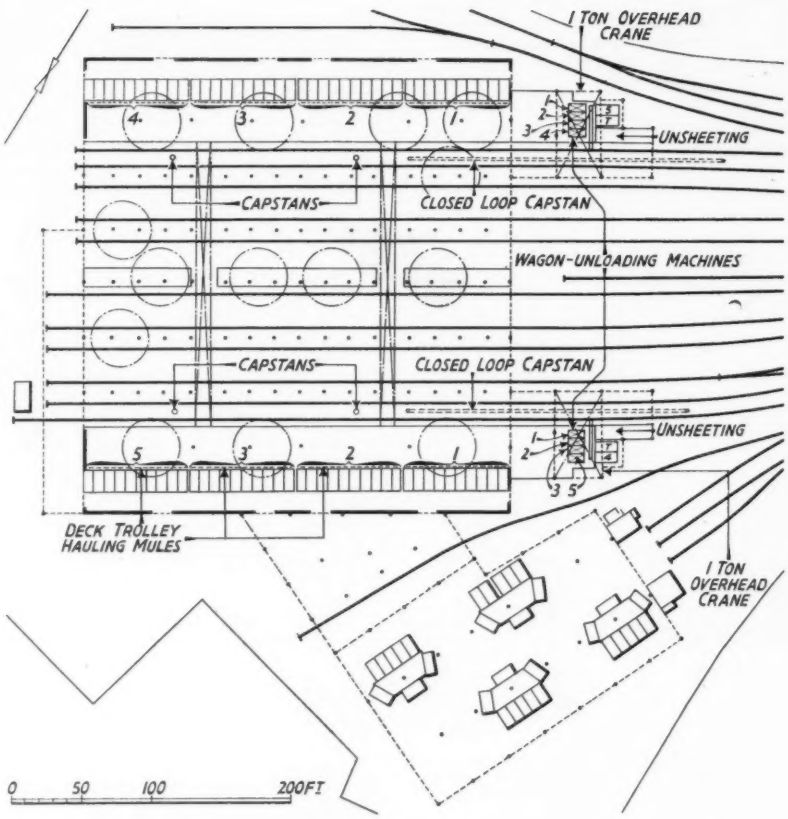
New siding accommodation for 44 additional wagons, to facilitate the handling of traffic in the yard, will be laid down outside the sheds, while the berths for road vehicles will be doubled.

### Manchester Scheme

The L.M.S.R. goods shed at Manchester (Ancoats) is one of the most important in the city, the daily traffic dealt with amounting to nearly 200 loaded wagons inwards and over 200 wagons outwards. In order to enable the traffic to be handled more efficiently and more economically, and in order to allow for the expansion in freight business, an extensive scheme of modernisation is to be carried out.

The two main decks over which the traffic is handled in the main goods shed will each be extended under cover by an additional 60 ft., with a width of 30 ft., and the extensions will each be equipped with a wagon-unloading machine. Other new equipment to be provided includes 2 capstans of a new type, 50 six-wheeled deck trolleys of 2-tons capacity, 5 electric tractors for the movement of the deck trolleys between the wagon-unloading machines and the cartage vehicles, and 8 electric "mules" for moving the deck trolleys along various sections of the cartage-loading front. Lighting, and other features will also be improved on the most modern standards.

With this equipment the methods of working the goods shed will be entirely revised to give quicker unloading or loading of goods from the railway wagons to the cartage vehicles and vice-versa, while the operations of bringing loaded wagons into the shed, removing empties after discharge and clearing wagons out of the shed after loading them with outwards traffic, will be greatly speeded-up.




*Manchester, Ancoats, goods shed with proposed extensions containing wagon-unloading machines and new outwards sorting platforms*

## L.M.S.R. Chief Operating Manager's Headquarters' Office Annual Dinner

The annual dinner of the Chief Operating Manager's Headquarters' office at Euston was held at the Strand Corner House on Friday last. Mr. C. R. Byrom, Chief Operating Manager, presided, and over 200 members of his staff were present. Light music was much enjoyed during the dinner, after which the toast list was intermingled with a variety of excellent musical items. Those present included:—

The President, Sir Josiah Stamp, also attended, with Sir Harold Hartley and Mr. W. V. Wood, Vice-Presidents; and Mr. H. V. Mosley, Chief Officer for Parliamentary and New Works and member of the Executive Committee. Other guests included: Messrs. A. F. Bound, W. H. C. Clay, G. L. Darbyshire, A. Eddy, J. Shearman, S. J. Symes, E. Taylor, W. K. Wallace, J. A. Kay, and D. R. Lamb.

Mr. Byrom, proposing the toast of "The L.M.S. Railway," said they most deeply appreciated the fact that in spite of all the difficulties and innumerable calls on his time Sir Josiah Stamp had made it convenient to be with them. He expressed the regret of everyone present at the absence of Mr. Lemon, Vice-President, and Mr. Fisher, Assistant Chief Operating Manager, and hoped that both would soon be fully restored to health. Amongst recent victims of the influenza epidemic whose absence was deplored were Mr. Ashton Davies, Chief Commercial Manager, and Mr. L. F. Rowlandson, Superintendent of Organisation and Staff. Continuing, Mr Byrom stated that his relations with other departments remained friendly. It was one of his pleasures in life to find such ready co-operation on the part of other departments, and he was sure it was this spirit of common interest that contributed so largely to the success of the company. He was of the opinion that the Operating Department could take unto itself some measure of satisfaction in the way the service had been provided to earn the 1936 revenue. He thanked the staff for their continuous help and good work throughout the year, and issued a word of warning that an even more strenuous time lay ahead with anticipated increased traffic, which if faced with similar determination would at the end of the year show still better results. To the younger members of the staff Mr. Byrom remarked that never were the days of railway life more full of opportunity. Opportunity, he said, may be a ticket for a long journey but it is generally available for the day of issue only.

Sir Josiah Stamp, replying to the toast, congratulated Mr. Byrom on his spirit in attending the dinner after having been laid up for a few days with influenza and expressed the hope of everyone that he would not be any the worse for it. He expressed his thanks for what had been accomplished in the face of continually increasing demands. During the past twelve months the department had frequently been in the public eye, as of course it should always be, and it had to its credit some wonderful achievements accomplished in the face of very difficult times. Continuing, Sir Josiah entertained with an exposition of statistical records of man-hours lost per

influenza germ to the delight of his listeners, and concluded with congratulations on behalf of the board and the executive to the Operating Department. It was realised that behind Mr. Byrom, great as he was, there must be a fine willing team to lead to such a result as he had been in the happy position of reviewing that evening.

Mr. D. C. Urie, Superintendent of Motive Power, proposed the toast of "Our Guests," and emphasised the fact that they were looked upon as the friends and well wishers of the department. Occasions such as these, said Mr. Urie, when we can see and hear the men who play a very important part in the organisation of the greatest railway in the world, are appreciated, and anything that tends to break down barriers and dispel mysticism is all to the good.

Mr. J. Shearman, Road Motor Engineer, in responding, expressed the appreciation of the guests at the warm welcome and hospitality extended to them, and mentioned the high esteem in which Mr. Byrom and the whole of his staff were held by the officers, and staffs of other departments. He said that the reputation and efficiency of the L.M.S. could not be in better hands than it was at the present time. Mr. Shearman delighted his hearers with reminiscences of the time he spent in the department pre-war as a "runner" at Crewe, and the subtle manner in which he introduced appropriate witticisms.

Mr. R. C. Pickerell gave the toast of "The Chairman." The staff thoroughly understood the tremendous job ahead of them, and he could assure Mr. Byrom that the spirit of the staff throughout was never better. In acknowledging the toast Mr. Byrom said how much he valued the loyalty, hard work and affection of each member of his staff.

The arrangements for the dinner were made by the committee, Messrs. Barris, Coe, Edge, Forshew, Gay, Lambert and Weston, under the chairmanship of Mr. F. A. Pope.

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TONBRIDGE ALTERATIONS ON THE SCREEN.—A feature of the monthly Railway Club meeting on January 14, at the Royal Scottish Corporation Hall, Fetter Lane, E.C., was a cinematograph exhibition by Mr. L. T. Catchpole. The subject of the film was "The Recent Alterations at Tonbridge Junction, Southern Railway," which Mr. Catchpole preceded with several lantern slides showing the development of the layout since 1842. The film first depicted scenes before the alterations, showing trains negotiating the awkward reverse curves. The various stages of the work at the West junction were shown, concluding with views of the present layout. Part two of the film dealt with alterations to the station itself, including the extended platforms, the new footbridge, and up bay. An interesting discussion followed as to whether the results of the alterations have justified the large expenditure.

# A Remarkable L.M.S.R. Performance

A most exceptional run was made by the down Royal Scot express of the L.M.S.R. on January 20. Details of the times and speeds are shown in the table annexed, from which it will be seen that 4-6-2 engine No. 6206, *Princess Marie Louise*, with a 16-coach train of 515 gross tons, gained 7¾ min. on schedule between Tring and Rugby, covering the 18·7 miles from Cheddington to Castlethorpe at an average of 81·8 m.p.h., and the 48·6 miles from Tring to Hillmorton at an average of 77·2 m.p.h. A maximum of 85 m.p.h. was reached at Sear's Crossing, near Leighton, but more notable than this were the minimum speeds of 72½ m.p.h. up the 4½ miles at 1 in 330 and 1¾ miles at 1 in 410 to Roade, and of 70½ up 3 miles at 1 in 350 to Kilsby tunnel, also the speed of 79 m.p.h. reached on practically level track at Weedon. The cut-offs employed, with full regulator, were 30 per cent. up Camden bank, 25 per cent. from Camden to Willesden, and 20 per cent. thence to the Berkhamsted slack; 30 per cent. in recovering from the slack to Tring, 25 per cent. from there to Sear's Crossing and 20 per cent. on to Wolverton; 25 per cent. from Wolverton up to Roade, and from Heyford through Weedon and up to Kilsby, and 20 per cent. from Roade to Heyford and from Kilsby onwards. Again beyond Rugby the performance was but little inferior, as notwithstanding a very long permanent way caution past Polesworth, and an unduly severe slowing to 22 m.p.h. through Stafford, 3½ min. further were gained to Crewe; on this stage perhaps the finest achievement was the steady acceleration from 60 m.p.h. at Norton Bridge to 67 m.p.h. at Whitmore, entirely on adverse grades, beginning at 1 in 650 and steepening finally to 2¾ miles at 1 in 398. Beyond Rugby 25 per cent. cut-off was used from Stafford up to Whitmore, and between 20 and 25 per cent. from Tamworth to Stafford. From Crewe to Carlisle, with load reduced to 450 tons (14 vehicles), the 141·0 miles were run in 155 min. 43 sec., or 150½ min. net, schedule being 159 min.; the best performance here was the time of 7 min. 57 sec. for the 5·5 miles from Tebay to Shap Summit, of which 4½ miles are at 1 in 75. So the total net gain by the locomotive amounted to precisely 20 min. between Euston and Carlisle. The locomotive was handled by Driver L. A. Earl of Camden shed, and the times of the run were recorded by Mr. Cecil J. Allen.

L.M.S.R. EUSTON–CREWE

Engine: 4-6-2 No. 6206, *Princess Marie Louise*.

Driver, L. A. Earl; Fireman, Abey (Camden shed).

Load, 16 coaches; 492 tons tare, 515 tons gross.

| Distance miles | | Schedule min. | Actual min. sec. | Speeds m.p.h. |
|---|---|---|---|---|
| 0·0 | EUSTON ... | 0 | 0 00 | — |
| 5·4 | WILLESDEN JUNCTION | 10 | 10 37 | — |
| 8·1 | Wembley ... | — | 13 22 | 59 |
| 11·4 | Harrow ... | — | 16 54 | 55 |
| 17·4 | WATFORD JUNCTION | 23 | 23 10 | 62½ |
| 20·9 | King's Langley | — | 26 35 | 61 |
| 24·5 | Hemel Hempstead ... | — | 30 05 p.w.s | 60 15 |
| 28·0 | Berkhamsted | — | 36 15 | — |
| 31·7 | TRING ... | 38 | 41 59 | — |
| 36·1 | Cheddington ... | — | 45 49 | 79 |
| 40·2 | Leighton ... | — | 48 50 | 85/80½ |
| 46·7 | BLETCHLEY | 51 | 53 33 | 83½/79 |
| 52·4 | Wolverton ... | — | 57 46 | 85 |
| 54·8 | Castlethorpe ... | — | 59 31 | — |
| 59·9 | ROADE ... | 63 | 63 33 | 72½ |
| 62·8 | BLISWORTH | 66 | 65 55 | 76½ |
| 69·7 | Weedon ... | — | 71 12 | 79 |
| 75·3 | Welton ... | — | 75 36 | 70½ |
| 80·3 | *Hillmorton* ... | — | 79 45 | 75 |
| 82·6 | RUGBY ... | 87 | 83 14 | — |
| 5·5 | Brinklow ... | — | 8 13 | 62½ |
| 10·9 | Bulkington ... | — | 13 12 | — |
| 14·5 | NUNEATON... | 16 | 16 09 | 77½ |
| 19·7 | Atherstone ... | — | 20 16 p.w.s. | 76½ |
| 23·9 | Polesworth ... | — | 23 55 p.w.s | 35 |
| 27·4 | TAMWORTH | 30 | 28 55 | †67 |
| 33·7 | LICHFIELD | 36 | 34 44 | 62½ |
| 38·4 | Armitage ... | — | 39 02 | 71½ |
| 41·7 | Rugeley ... | 43 | 41 43 | 75 |
| 46·9 | Milford ... | — | 46 03 | 70½ |
| 51·0 | STAFFORD* | 53 | 51 13 | 22 |
| 56·3 | Norton Bridge | 60 | 57 36 | 60 |
| 60·8 | Standon Bridge | — | 61 52 | 64½ |
| 65·0 | Whitmore ... | 69 | 65 42 | 67 |
| 70·7 | Betley Road ... | — | 70 31 | 80½ |
| 75·5 | CREWE ... | 80 | 76 34 | — |

* Service slack.
† At Hademore.

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REBUILT NORD 4-6-0.—By an inadvertence, the number of the 4-6-0 locomotive of the Nord which was mentioned in the article on French locomotive performance in our January 22 issue as having been rebuilt with the Lemâitre variable exhaust arrangement, was given as 3.999, and the engine was described as having originally been a 4-4-2 locomotive converted to the 4-4-4 wheel arrangement. Actually, the reconditioned engine is No. 3.556 of the standard 4-6-0 3.500 class.

ABERDEEN SUBURBAN SERVICES.—Owing to insufficient patronage, the L.N.E.R. has decided to withdraw the suburban passenger train services between Aberdeen and Culter and Aberdeen and Dyce on and after April 5. The through services passing over these sections of the line will not be affected and the stations at present served by through trains, namely, Cults, Culter, Kittybrewster, Bucksburn, and Dyce, will still remain open for this purpose. These five stations will also be available for the parcels traffic meantime handled at the stations to be closed. On April 5, also, the freight train services to Murtle and Milltimber will be withdrawn, but Cults and Culter stations will thereafter be available for freight traffic meantime handled at Murtle and Milltimber. In announcing these withdrawals, the L.N.E.R. states that the traffic on these suburban lines has been operated at considerable and increasing loss for several years.

## Permanent Way Institution Annual Dinner

Mr. W. K. Wallace, Chief Engineer of the London Midland & Scottish Railway, took the chair at the annual winter dinner of the Permanent Way Institution, of which he had just been re-elected President for the third year in succession, on Saturday last. The function was held at the Charing Cross Hotel, and those present included:—

Messrs. D. R. Bennett, K. Brinsmead, J. H. Condy, R. Carpmael, N. M. Clougher, G. Ellson, R. W. Gairns, R. Gaudin, R. Gurd, F. E. Harrison, W. Hepworth, H. Janes, J. A. Kay, J. H. Knotts, D. R. Lamb, F. Lawson, C. A. G. Linton, S. E. McLewin, J. W. Melville, J. Miller R. F. Morkill, Col. A. H. L. Mount, Messrs. H. C. Muggeridge, S. L. Murgatroyd, J. Petrie, A. S. Quartermaine, J. Ratter, V. A. M. Robertson, C. P. Sandberg, T. H. Seaton, Sir Josiah Stamp, Messrs. C. F. Tofts, E. H. Tustain, and W. A. Willox.

Sir Josiah Stamp, G.C.B., G.B.E., proposed the toast of "The Permanent Way Institution," and referred to the progress made by the institution since its formation by a few permanent way inspectors 52 years ago, and to the activities of its local sections, representing an aggregate membership of 2,650. These members were engaged in a most important branch of the railway service—that of maintaining its tracks at the high standard which modern conditions necessitated. Not only was it considered necessary today that train running should be sufficiently smooth to permit of reading whilst travelling, it had also to permit of writing, and in this connection there were certain simple tests which could be employed to gauge the smoothness of riding, notably the placing of a tumblerful of water on the floor of a coach and noting the result when running at high speed. It was important that the water should be quite pure; the addition of even a small proportion of whisky was apt to have disastrous effect on the stability of the permanent way, especially in Scotland.

The Permanent Way Institution was unique in that its membership comprised all grades of the engineering staffs, from platelayers to chief engineers, meeting together with the one common object of pooling their knowledge in order to achieve the best possible results. The failure of any one of these grades to perform in an efficient manner the duties entrusted to it would reduce to nought the work of the rest, and only by close co-operation as evidenced by the work of the institution could true efficiency be achieved. Thus the aim of each individual should be to carry out to the best of his ability the particular job entrusted to him. It was a mistake to attach too much importance to tradition, and it was of importance that new appliances and changed methods of working should be tried out at every opportunity. It did not follow that methods which had obtained for 100 years were necessarily the best. The failures against which permanent way men had to guard—slips, subsidences, broken rails and the like—were perhaps small in themselves, but could lead to great disasters, and in consequence there was a need for the continuance of the constant alertness which had for so long characterised the work of the permanent way staff; there could be no doubt that, due to modern conditions, the tracks were being subjected to ever-increasing demands.

In coupling with the toast the name of Mr. W. K. Wallace, the President, Sir Josiah Stamp referred to the respect and esteem in which Mr. Wallace was held by all his colleagues in the railway service.

Mr. Wallace, responding, spoke of Sir Josiah's reference to the demands made on the permanent way and which were rising in a rapidly increasing curve year by year. Chief among these were the requirements of the Commercial Departments, who had discovered that speed was a commodity for which they had a ready sale. These requirements showed signs of being even more severe in the future than in the past, but the rank and file would continue to meet the demands made upon them without sacrifice of the railways' record of safety. An important feature of the institution's work was that it enabled a pooling of knowledge to take place. If a man discovered a better way of carrying out a job, the sectional meeting provided an opportunity for passing the knowledge on to others, and also permitted the problem as a whole to receive due consideration.

One of the chief problems confronting the permanent way staff was the increasing appeal of week-end travel to the British public, in that the growth of such traffic reduced the number of occasions when the Operating Department could give possession of a road, and notwithstanding these difficulties, the track would need to be maintained without causing expenditure to rise proportionately with the increase in gross receipts.

Mr. G. Ellson, O.B.E., Chief Engineer, Southern Railway, proposed the toast of "The Guests" and made special mention of the ladies; Sir Josiah Stamp, one of the most versatile of living men, holding honorary degrees of no fewer than 15 universities; Col. A. H. L. Mount, Chief Inspecting Railway Officer of the Ministry of Transport; Mr. J. A. Kay of THE RAILWAY GAZETTE, than which there was no better railway publication in the world, and the standard of which seemed to rise year by year; and Mr. D. R. Lamb of *Modern Transport*, which dealt ably with the wider field of transport as a whole.

Mr. D. R. Lamb responded to the toast on behalf of the guests and said that they considered it an honour to be present among so many distinguished members of the engineering profession.

Mr. R. Carpmael, O.B.E., Chief Engineer, Great Western Railway, proposing the toast of "Absent Friends," said that among those of whom they would be thinking especially were Mr. A. R. Cooper, the immediate Past-President of the Institution, who, as Chief Engineer of the L.P.T.B., was responsible for past and future Underground engineering developments; Sir Alexander Gibb, a celebrated consulting engineer who this year held the office of President of the Institution of Civil Engineers; Lt.-Col. Szlumper; Sir Charles Morgan; all those who were prevented from being present on account of their duties, and in particular members of the institution abroad, resident in 28 different countries.

## Recent Developments in Special Wagons

At Manchester on Thursday, January 21, a lecture was given at the Central Library before members of the Manchester and District Traffic Association by Mr. D. H. Hawkeswood, of the Chief Goods Manager's Office, G.W.R., Paddington. The subject dealt with was "The Recent Developments in Special Wagons, Containers, &c.," and the lecture was illustrated by eighty lantern slides showing the various types of vehicles and containers now operating on the railways for all classes of traffic both by goods and passenger train services. Mr. Hawkeswood, in his opening remarks, referred to the modern tendency of the railway companies to develop wagons and containers to meet the needs of specific traffics, and suggested that this was ample evidence of the close co-operation which now existed between the manufacturer and the railway as a transport agency. Some interesting remarks were made regarding the origin and use by the G.W.R. of wagon code names. Illustrations showed many examples of special and out-of-gauge loads on high capacity wagons, bulk grain wagons, partitioned vans (which have already been illustrated and described in these columns), convertible motorcar trucks, insulated containers, insulated milk vans, road-rail milk tanks, and the G.W.R. streamlined diesel railcar for parcels traffic. The meeting was held under the chairmanship of Mr. Mycoe, of Metropolitan-Vickers, who expressed on behalf of the members present their pleasure in listening to so informative a talk on a subject of considerable interest at present. A vote of thanks was proposed by Mr. Royle of the Co-operative Wholesale Society, and seconded by Mr. Lunn of W. T. Glover & Co.

XUM

# MINISTRY OF TRANSPORT ACCIDENT REPORT

**Between Radstock and Bath, S. & D.J.R.: July 29, 1936**

The L.M.S.R. 0-6-0 tank engine No. 7620, propelling eight empty wagons, ran away unattended at about 10.0 a.m. on the right (up) line from near Braysdown signal box (about 1 mile north of Radstock), past Wellow station; the wagons became derailed and did considerable damage at Midford, 5¼ miles nearer Bath, where the line becomes single. The engine continued to propel a portion of a wagon through the Combe Down and Devonshire tunnels, and was derailed and stopped about ¾ miles from the latter. The line approaches Braysdown on a down grade of 1 in 120, undulates and falls gradually through Midford, approaching there at 1 in 60 down. It then rises at 1 in 100 and 1 in 50 to Combe Down tunnel, 1 mile long on 1 in 100, and falls thence at 1 in 50 and 1 in 66 for 2 miles to Bath Junction, where the L.M.S. Mangotsfield line comes in. Lt.-Col. E. Woodhouse conducted the inquiry.

Eight wagons had been left on the up line, after which Signalman Haines, Braysdown, accepted the 8.10 a.m. freight train, Evercreech Junction to Bath, which runs only when required, and arranged with Shunter Ash for engine No. 7620 to come through No. 6 crossover and propel the wagons beyond the starting signal to provide, he said, the 440-yd. overrun. Although they appeared to be standing beyond it, Ash informed him they were closer. "Warning" acceptance is not authorised here, and Haines said he thought it was 440 yd. between home and starting signals, although the cabin diagram showed it to be 399 yd. only, but this was the first time he had accepted a train with vehicles standing north of the starting signal. He further said that Signalman Crouchen, who had instructed him how to work the box, took the starting signal as the clearing point, but Crouchen denied this and said he had told Haines it was 50 yd. beyond the signal. Haines, though usually doing so, failed to block back on this occasion, saying a telephone call made him forget. He saw the engine of the freight train running past the home signal, heard a sound as of engines colliding, and, seeing No. 7620 and wagons disappearing round the curve, he sent "Train running away" to Wellow. He also telephoned there and tried unsuccessfully to inform the Control Office. Shunter Ash was certain he left the wagons with one or two inside the starting signal, and was preparing to couple the engine when he noticed the freight train. He shouted to Driver Rawlings to push away, and thought the two engines just touched. No. 7620 steamed away, and finding Rawlings and the fireman had left the footplate he ran to tell Haines.

Driver Brewer, of the freight train, was watching his fireman, Hiroms, breaking up clinker, and did not see Braysdown distant signal, nor the home, till he was close to it. He saw the shunting engine, applied the steam brake and reversed, but he failed to secure the reversing handle, which spun round into forward gear again. The regulator jammed partly open. He told Hiroms to jump, and did so too, and asserted that the other driver jumped before he did. The speed was then about 10 m.p.h.

Rawlings, driver of the shunting engine, said the wagons were left near Braysdown Colliery siding. Ash shouted, and he opened the regulator fully to get them on the move, shouted to his fireman, Parker, to look after the engine, and left it, as he could see nobody on the other one, 30 to 40 yd. away. On the ground he saw Brewer and Hiroms applying wagon brakes, which he was intending to do. He was able to board the freight train engine, however, and had no difficulty in closing the regulator. It stopped in 50 or 60 yd. Parker's excuse for leaving the footplate was that he expected a serious collision. He did not recollect Rawlings telling him to take charge, but corroborated the statement that the wagons were left at no great distance from Braysdown Colliery siding points.

## Inspecting Officer's Conclusions

Colonel Woodhouse feels unable to accept Haines' statement that he thought the starting signal was the clearing point. After due consideration, he prefers to accept the statement of the driver and fireman of the shunting engine that the wagons were only just north of Braysdown Colliery siding. This invalidates Haines' excuse about the clearing point, and makes his omission to block back more serious. But though primarily to blame, his mistakes would have had no untoward consequences had the enginemen remained at their posts. Driver Brewer's conduct is particularly to be deplored, both in allowing supervision of his somewhat inexperienced fireman to interfere with observation of signals, and in not taking the earliest opportunity to see the home signal, having missed the distant. His abandonment of the engine was quite indefensible. Hirom's action, he being only 19, in jumping, at Brewer's instructions, is not deserving of censure. From inspection of a similar engine Colonel Woodhouse is satisfied that Brewer's statement regarding the behaviour of the reversing gear may be accepted.

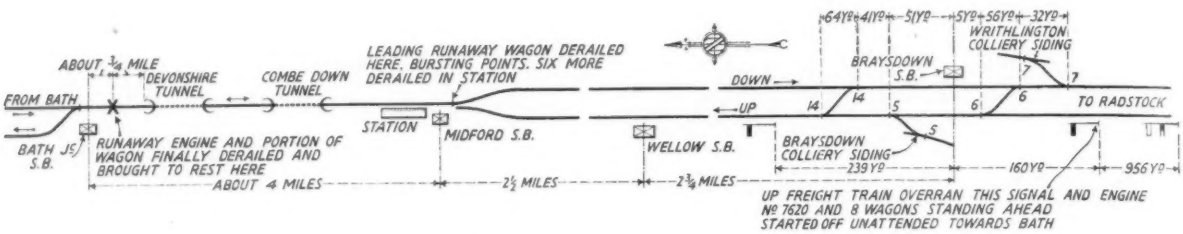


*Diagram showing the course taken by the runaway*

A considerable share of responsibility rests on Rawlings and Parker. It is difficult to believe that the former knew there was nobody on the freight engine. He is open to very serious criticism in leaving his engine, with the regulator open, without making certain that Parker was prepared to take charge. Both men lost their heads. Rawlings is to be commended for boarding the freight engine, but this appears to have been an afterthought. He could have nullified the mistakes of Haines and Brewer by applying his brakes as soon as the engines were in contact, and then changing footplates.

## Remarks and Recommendations

It was fortunate there was no personal injury, and providential that no collision on the single line resulted. In the event of vehicles running away on a single line, or, as in this instance, on a double line leading to a single line, a head-on collision may be averted if a warning of what has occurred reaches a point sufficiently far ahead in time to enable a train travelling in the opposite direction to be kept out of their path. Colonel Woodhouse suggests it should be impressed upon signalmen, at boxes likely to be affected, that if they cannot divert runaway vehicles at a facing connection or at trap points, they should pass on the "Train running away" signal *immediately* it is received, before they take the prescribed action with detonators and hand signals, which may prove to be ineffectual.

# QUESTIONS IN PARLIAMENT

### Electrification in Lancashire

Mr. A. Chorlton (Bury, C.), on January 28 asked the Minister of Transport whether he was yet able to report the result of the conference of Lancashire transport authorities in Manchester; if any agreement for the co-ordination of service had been arrived at; and, if so, when the railway company concerned propose to begin electrification of the lines in that area.

Mr. Hore-Belisha (Minister of Transport): I have received no further information from the authorities in question.

### Soldiers' Railway Concessions

Mr. J. Smedley Crooke (Deritend, C.), on January 28, asked the Secretary of State for War, if his attention had been drawn to the disappointment felt by young soldiers of regiments detailed for service overseas in not being given leave on free railway warrants to go to their homes for taking leave of their parents and other relatives before embarkation; and whether, in view of the necessity for offering inducements to aid recruiting, he would consider the advisability of granting leave to those soldiers in similar circumstances.

Sir Victor Warrender (Financial Secretary to the War Office): I can understand that some disappointment is felt in this matter but I fear that the cost of granting the concession makes it impracticable. All soldiers when travelling on leave, are, however, entitled to the railway concession of half the ordinary rate charged to the general public.

Mr. Smedley Crooke (Deritend—C.) on February 3 asked the Secretary of State for War if he could state the approximate cost to the country if free railway warrants were issued to soldiers who are detailed for oversea service who apply for leave to see their relatives before embarking; and would he consider the advisability of giving free warrants in these circumstances as one of the possible aids to recruiting.

Sir Victor Warrender (Financial Secretary to the War Office): The estimated cost is £17,000 annually. While my right hon. friend appreciates that any concession is an aid to recruiting, he is necessarily limited by the financial factor, and he does not consider that the granting of this particular concession should take priority over others of a more urgent nature.

### Canton-Hankow Railway

Mr. A. E. Moreing (Preston—C.) on February 1 asked the Secretary of State for Foreign Affairs, if he had any information as to the progress of the negotiations for an agreement between the Chinese government and the bondholders of the Canton-Hankow (Hukuang) Railway for the payment of arrears of interest due to the bondholders and to ensure the regular payment of interest in future.

Mr. Eden: I understand that the negotiations referred to by my hon. friend are continuing, but I am not in a position to make a statement at present.

### Night Postal Train to Scotland

Sir Malcolm Barclay-Harvey (Kincardine and Western, C.), asked the Postmaster-General, on how many occasions the night postal train from Euston to Scotland missed its proper connections at Aberdeen in the years 1934, 1935, and 1936 respectively.

Major Tryon (Postmaster-General): The figures are 31, 35, and 57 respectively. The matter is under investigation.

Sir M. Barclay-Harvey asked the Postmaster-General if he would take energetic steps with the railway company to secure better punctuality.

Major Tryon replied that his department was going into the matter. The failures were due to railway accidents, breakdowns, traffic difficulties, fogs, and snowstorms.

Sir Malcolm Barclay-Harvey asked Major Tryon if he would consider transferring the contract to the London & North Eastern Railway.

No answer was returned.

### Leopoldina Railway Company

Sir Nicholas Grattan-Doyle (Newcastle-upon-Tyne—C.) on February 1 asked the Secretary of State for Foreign Affairs, whether he was aware that the directors of the Leopoldina Railway Company had been unable to protect this British investment which was being gradually confiscated by the action of the Brazilian government, which now found itself compelled to furnish the company with a loan; and would he notify that government that the unfair treatment of British savings placed at the disposal of the Brazilian public for developing Brazilian resources was regarded with disapproval by His Majesty's Government.

Mr. Anthony Eden (Foreign Secretary): I have received no request for support from the company in question, and it will be realised that the question of instructing His Majesty's Ambassador at Rio de Janeiro to make representations on the subject to the Brazilian Government could not be considered unless such a request were received.

### Alcoholic Refreshment on Railway Trains

Mr. C. G. Ammon (North Camberwell—Lab.) on February 2 asked the Secretary to the Treasury whether the granting of an excise licence for the sale of alcoholic refreshment on railway trains was made subject to any restrictions as to hours of sale and the soliciting of orders and the serving of such refreshments in ordinary passenger compartments.

Lieut.-Colonel Colville (Financial Secretary to the Treasury): The answer is in the negative.

### Level Crossings

Mr. H. Day (Southwark, Central, Lab.), on February 3 asked the Minister of Transport, whether he would give particulars of how many schemes and/or proposals he had made during the 12 months ended to the last convenient date for the purpose of eliminating level crossings and freeing toll bridges; and the number of cases that were before the responsible highway authorities or his department at the present time.

Mr. Hore-Belisha (Minister of Transport): I have no means of knowing how many cases are at present under consideration by Highway Authorities, but during the twelve months ended December 31, 1936, grants have been made towards the construction of bridges to avoid five level crossings and a grant has been promised to a further scheme. In the same period grants have been made, or offered, for freeing five toll bridges, and a further bridge is being reconstructed with assistance from the Road Fund on condition that tolls will be abolished when the reconstructed bridge is opened to traffic.

# Staff and Labour Matters

### Road Transport Wages

It was announced last week that endeavours are to be made to establish a wage-fixing machinery, on a national basis, in respect of the staff of the many privately-owned road passenger undertakings. The employees concerned number many thousands and are organised by the Transport and General Workers' Union and the National Union of Railwaymen. These two unions are believed to represent a considerable percentage of the workers engaged in passenger road transport. A joint industrial council for the tramway industry has been in operation since 1919 and the new machinery contemplated would cover bus workers outside the area of the London Passenger Transport Board. Meetings will be held in Leeds under the chairmanship of Mr. John Marchbank (General Secretary of the National Union of Railwaymen) and the secretaryship of Mr. H. Clay (of the Transport and General Workers' Union), on February 10 and 11, when it is expected that delegates will attend from all parts of the country to express their views on the question.

# Railway and Other Reports

**Mersey Railway.**—The directors at their meeting on January 28 resolved to pay the full dividend of 3 per cent. on the perpetual preference stock and to recommend a payment of a dividend of $\frac{7}{8}$ per cent. on the ordinary stock. The dividend on the ordinary stock for 1935 was $\frac{3}{4}$ per cent.

# NOTES AND NEWS

**Re-naming Pontefract Stations.**—For greater convenience Pontefract (L.M.S.R.) station has been re-named Pontefract (Monkhill); Tanshelf (L.M.S.R.) has been re-named Pontefract (Tanshelf); and Pontefract (S. & K. Joint) has been renamed Pontefract (Baghill).

**New G.W.R. Railcar.**—The Great Western Railway is about to put into service on the Lambourn Valley branch the eighteenth A.E.C. diesel-mechanical railcar. This vehicle differs from the preceding 17 vehicles in that it is arranged for trailer haulage, but is of the same power as all of the previous cars except the first, namely, 260 b.h.p.

**Railway Bills in Parliament.**—The following Bills were presented and read the first time in the House of Commons on February 2, and ordered to be read a second time: Great Western Railway; London & North Eastern Railway; London Midland & Scottish Railway; London Passenger Transport Board; North Staffordshire Road Transport Board; Southern Railway. These Bills are down for second reading on February 8.

**450 New Containers for the L.M.S.R.**—The L.M.S.R. is to increase its container fleet by a further 450 new vehicles which will be ready in time for service this year. The new containers will comprise: 200 F.M. type (insulated for chilled meat and with hanging facilities); 100 "A" (small covered type); 100 "B" (large covered type); and 50 "B.C." (for cycles). When the new vehicles are in service, the L.M.S.R. container fleet will consist of 7,966 vehicles.

**Canadian National Finance.**—The Canadian Government introduced in the House of Commons, on January 29, a Bill for recasting the capital structure of the Canadian National Railways. Among the proposals are the abandonment by the Government of its claims on the railways for $361,250,000 advanced to meet deficits, and $495,000,000 for interest on advances, the cancellation of the nominal value of capital stock in the Canadian Northern Railway, and its replacement by an issue of $18,000,000 Canadian National Railway stock which the Minister of Finance would hold.

**Wagon Builders' Merger.**—Reference was made at the meeting of Charles Roberts & Company held on February 3 to the proposed purchase of the share capital of S. J. Claye Limited, one of the largest of the company's competitors, and it was stated that that company had a full order book, and should contribute its quota of profit towards the dividend payable on the enlarged capital. The hired wagons of S. J. Claye Limited and Sam E. Stevens Limited (the share capital of which had been purchased during the past month) could be run economically and efficiently in conjunction with the company's own fleet. The purchase would obviate the necessity of any large capital expenditure upon extensions to the company's works.

**Coal Factors' Dinner.**—Capt. H. F. Crookshank, Secretary for Mines, will be the principal speaker at the fourteenth annual dinner of the Rail-borne Coal Factors' and Wholesale Merchants' Association which will be held at Grosvenor House on Monday, February 8, under the chairmanship of Mr. John Charrington, Jun.

**L.N.E.R. Camping Coaches.**—As the result of the success of the railway camping coaches first introduced by the L.N.E.R. in 1933 and the steadily increasing demand for this type of holiday, the L.N.E.R. proposes to convert and equip an additional ten coaches for service at selected beauty spots in the North of England and Scotland during the present year. This will bring the total of camping coaches in service on the L.N.E.R. up to 116.

**G.W.R. Rateable Value.**—The rateable value of the Great Western Railway in London for the quinquennial period 1931-36 has been reduced from approximately £36,625 to £20,086, a reduction of over 45 per cent. The valuation roll for the company for the period 1931-36 has now been completed and it gives the net annual value as £1,650,000, a decrease of £1,150,000 on the draft roll. Of the total value, £1,492,668 relates to railways, and the remainder, £157,332 to docks and canals.

**The Transandine Railway.**—It is now officially announced that the Argentine Government has decided to take over control of the Argentine Transandine Railway, and terms for its acquisition are to be arranged. Through rail traffic was interrupted in January, 1934, by floods and an avalanche which destroyed a portion of the Argentine section, and the necessity of re-establishing railway communication with Chile has induced the Argentine Government to order the reconstruction of the destroyed portion, and this involves the Government taking control.

**Canadian Railway Wages.**—The majority report of the conciliation board, which has been considering the application of Canadian railway workers for a restoration of the existing 10 per cent. cut in wages, rejects the workers' application as unlikely to be practicable, and recommends instead reductions of the cut to 9 per cent. of the basic rate of pay from February 1, to 8 per cent. not later than August 1, and to 7 per cent. not later than November 1. After this, reductions would take place according to a sliding scale based on increases in the combined gross operating revenues of the railways. Restoration of the whole cut within the present year would, it is estimated by the majority report, cost the railways $18,000,000 yearly. The majority report is signed by the chairman and a representative of the railway companies. The workers' representative urged complete restoration of the cut. A railway union conference on February 3 rejected the majority report.

**Strabane & Letterkenny Railway.**—At the annual meeting of the Strabane & Letterkenny Railway, held in Londonderry on January 29, the Chairman, Captain J. C. Herdman, D.L., stated that the number of passengers showed a slight falling off compared with the previous year, but 6,000 more than two years ago. Goods traffic showed an increase, but the carriage of eggs had fallen, due to certain examination restrictions, imposed by the Agricultural Department. Live stock figures showed an increase.

**Stratfordians' Association.**—A reunion dinner of the Stratfordians' Association (comprising past and present staff of the Chief Mechanical Engineer's Department, L.N.E.R.) was held at the Liverpool Street Hotel, on January 29. About 40 members were present, and the chair was occupied by Major C. C. B. Morris, Chief of the London Fire Brigade. The toast of "Old Stratfordians all over the World" was proposed by J. I. Hill and responded to by A. P. Parker. J. B. Corrie proposed "The London & North Eastern Railway Company and Present Stratford Men," to which S. L. Baister responded. A. C. Kelly proposed "The Dinner Committee," to which C. W. L. Glaze and A. W. Headley replied. "The Chairman" was proposed by F. V. Russell.

**Extension of Loud-Speaker System at L.M.S.R. Stations.**—So successful have been the loud-speakers installed at various stations on the L.M.S.R. for directing crowds and for conveying information to passengers, that the company is to extend the system during 1937. Installations are to be provided at Holyhead, Fleetwood, and Llandudno Junction, and consideration is being given to the provision of similar equipment at numerous other stations including Chester, Crewe, Leicester, Manchester (London Road and Victoria), Preston, Sheffield, Wembley, and Longsight. The loud-speakers at Euston, St. Pancras, Birmingham, Derby, and a number of seaside stations including Blackpool, Morecambe, Southport, Rhyl, and Southend-on-Sea have proved most useful, especially at holiday times.

**Northern Ireland Traffics.**—Passenger receipts for the first ten months of 1936 on railways wholly in Northern Ireland amounted to £255,692, against £234,091 for the corresponding period of 1935, with an improvement from 5,068,411 to 5,274,275 in the number of passengers (apart from season ticket holders) carried. Merchandise and mineral tonnage for the ten months advanced from 450,406 tons to 496,832 tons, and the total goods traffic receipts

from £151,382 to £183,611. Railways partly in Northern Ireland carried 5,043,710 ordinary passengers in the first ten months of 1936, against 5,099,653 in the first ten months of 1935, but total passenger receipts improved from £382,069 to £401,080. The quantity of merchandise and minerals carried fell from 800,656 tons to 776,046 tons, although total goods traffic receipts rose from £523,567 to £526,531. On the purely northern railways the number of livestock carried during the ten months advanced from 159,126 to 164,117, but on the cross-border railways it fell from 643,138 to 627,254.

**L.N.E.R. Property Sale.**—After holding 33 houses in Broadhurst Gardens, Finchley Road, for more than 40 years, the L.N.E.R. has disposed of them, and the auction which had been arranged (to which we made reference on page 74 of our January 8 issue) will not be held. The leasehold interest was acquired from Sir Spencer Maryon Maryon-Wilson by the Manchester, Sheffield, and Lincolnshire Railway Company, afterwards the Great Central Railway. The houses, Nos. 1-25 and 29-67 (odd), Broadhurst Gardens, are freehold, and *The Times* states that the gross rents are £4,247 a year. Messrs. Rees-Reynolds and Hunt (Lincoln's Inn Fields) were to have offered them at the London Mart on February 18. The houses in Lot 1 stand on a rectangular site just behind a new block of business premises and flats, immediately south of Finchley Road station.

**Re-housing and Euston Station Rebuilding.**—Speaking last week at the annual meeting of the St. Pancras House Improvement Society Limited, Mr. I. B. M. Hamilton, the Society's architect, said that the L.M.S.R. had asked the society to arrange for re-housing of its tenants, whose homes were to be demolished in the course of rebuilding Euston station. A site in the neighbourhood of Highgate Road is to be provided by the L.M.S.R. and the work will be put in hand this year. The site is already the property of the L.M.S.R., and the society, which will undertake the whole work of re-housing, will lease this land from the railway and will build and let the necessary buildings.

## British and Irish Traffic Returns

| GREAT BRITAIN | Totals for 4th Week | | | Totals to Date | | |
|---|---|---|---|---|---|---|
| | 1937 | 1936 | Inc. or Dec. | 1937 | 1936 | Inc. or Dec. |
| | £ | £ | £ | £ | £ | £ |
| L.M.S.R. (6,914½ mls.) | | | | | | |
| Passenger-train traffic... | 366,000 | 361,000 | + 5,000 | 1,458,000 | 1,445,000 | + 13,000 |
| Merchandise, &c. ... | 465,000 | 441,000 | + 24,000 | 1,857,000 | 1,788,000 | + 69,000 |
| Coal and coke ... | 289,000 | 301,000 | − 12,000 | 1,133,000 | 1,207,000 | − 74,000 |
| Goods-train traffic ... | 754,000 | 742,000 | + 12,000 | 2,990,000 | 2,995,000 | − 5,000 |
| Total receipts ... ... | 1,120,000 | 1,103,000 | + 17,000 | 4,448,000 | 4,440,000 | + 8,000 |
| L.N.E.R. (6,332 mls.) | | | | | | |
| Passenger-train traffic... | 246,000 | 243,000 | + 3,000 | 983,000 | 968,000 | + 15,000 |
| Merchandise, &c. ... | 331,000 | 314,000 | + 17,000 | 1,282,000 | 1,267,000 | + 15,000 |
| Coal and coke ... | 264,000 | 277,000 | − 13,000 | 1,039,000 | 1,107,000 | − 68,000 |
| Goods-train traffic ... | 595,000 | 591,000 | + 4,000 | 2,321,000 | 2,374,000 | − 53,000 |
| Total receipts ... ... | 841,000 | 834,000 | + 7,000 | 3,304,000 | 3,342,000 | − 38,000 |
| G.W.R. (3,746½ mls.) | | | | | | |
| Passenger-train traffic... | 148,000 | 157,000 | − 9,000 | 623,000 | 629,000 | − 6,000 |
| Merchandise, &c. ... | 185,000 | 177,000 | + 8,000 | 736,000 | 713,000 | + 23,000 |
| Coal and coke ... | 115,000 | 121,000 | − 6,000 | 465,000 | 493,000 | − 28,000 |
| Goods-train traffic ... | 300,000 | 298,000 | + 2,000 | 1,201,000 | 1,206,000 | − 5,000 |
| Total receipts ... ... | 448,000 | 455,000 | − 7,000 | 1,824,000 | 1,835,000 | − 11,000 |
| S.R. (2,153 mls.) | | | | | | |
| Passenger-train traffic... | 248,000 | 244,000 | + 4,000 | 993,000 | 965,000 | + 28,000 |
| Merchandise, &c. ... | 60,000 | 62,500 | − 2,500 | 222,000 | 232,500 | − 10,500 |
| Coal and coke ... | 41,000 | 46,500 | − 5,500 | 143,000 | 168,500 | − 25,500 |
| Goods-train traffic ... | 101,000 | 109,000 | − 8,000 | 365,000 | 401,000 | − 36,000 |
| Total receipts ... ... | 349,000 | 353,000 | − 4,000 | 1,358,000 | 1,366,000 | − 8,000 |
| Liverpool Overhead ... (6½ mls.) | 1,191 | 1,126 | + 65 | 4,857 | 4,751 | + 106 |
| Mersey (4½ mls.) ... | 4,183 | 4,063 | + 120 | 17,542 | 16,937 | + 605 |
| *London Passenger Transport Board ... | 533,200 | 549,400 | − 16,200 | 17,334,600 | 16,872,800 | + 461,800 |
| IRELAND | | | | | | |
| †Belfast & C.D. pass. (80 mls.) | 1,372 | 1,614 | − 242 | 7,048 | 7,881 | − 833 |
| ,, ,, goods | 528 | 614 | − 86 | 1,865 | 2,230 | − 365 |
| ,, ,, total | 1,900 | 2,228 | − 328 | 8,913 | 10,111 | − 1,198 |
| Great Northern pass. (543 mls.) | 7,150 | 7,750 | − 600 | 30,100 | 31,050 | − 950 |
| ,, ,, goods | 10,300 | 10,900 | − 600 | 36,450 | 40,550 | − 4,100 |
| ,, ,, total | 17,450 | 18,650 | − 1,200 | 66,550 | 71,600 | − 5,050 |
| Great Southern pass. (2,075 mls.) | 23,281 | 25,758 | − 2,477 | 102,199 | 104,890 | − 2,691 |
| ,, ,, goods | 37,887 | 37,755 | + 132 | 175,140 | 169,872 | + 5,268 |
| ,, ,, total | 61,168 | 63,513 | − 2,345 | 277,339 | 274,762 | + 2,577 |

* 31st week † 5th week

## British and Irish Railways Stocks and Shares

| Stocks | Highest 1936 | Lowest 1936 | Prices Feb. 3, 1937 | Prices Rise/Fall |
|---|---|---|---|---|
| G.W.R. | | | | |
| Cons. Ord. ... | 64¼ | 45½ | 62½ | +¾ |
| 5% Con. Prefce ... | 126½ | 116¾ | 124 | −1 |
| 5% Red. Pref. (1950) | 113 | 108½ | 111½ | — |
| 4% Deb. ... ... | 119½ | 110½ | 110 | — |
| 4¼% Deb. ... | 121 | 114 | 116½ | — |
| 4½% Deb. ... | 129 | 121 | 121½ | — |
| 5% Deb. ... ... | 141 | 134 | 132½ | — |
| 2½% Deb. ... | 79⅛ | 74 | 75½ | — |
| 5% Rt. Charge ... | 136½ | 130 | 130 | −1 |
| 5% Cons. Guar. ... | 135¼ | 127¾ | 130 | −1 |
| L.M.S.R. | | | | |
| Ord. ... ... | 35⅝ | 17 | 32½ | — |
| 4% Prefce. (1923) | 83 | 52½ | 79½ | +1 |
| 4% Prefce. ... | 92¾ | 81 | 88 | — |
| 5% Red. Pref. (1955) | 109¼ | 103¼ | 107 | — |
| 4% Deb. ... ... | 111¾ | 105 9/16 | 103½ | −½ |
| 5% Red. Deb. (1952) | 119⅝ | 115½ | 115½ | — |
| 4% Guar. ... | 106¾ | 101⅝ | 99* | −1 |
| L.N.E.R. | | | | |
| 5% Pref. Ord. ... | 14 | 9 | 11½ | — |
| Def. Ord. ... | 7¼ | 4¾ | 5⅝ | −⅛ |
| 4% First Prefce. | 79¼ | 55¼ | 76 | — |
| 4% Second Prefce. | 31⅞ | 18¼ | 26½ | — |
| 5% Red. Pref. (1955) | 100½ | 77¾ | 100 | — |
| 4% First Guar. ... | 104½ | 98¾ | 97 | −1 |
| 4% Second Guar. | 99 | 90 | 93 | — |
| 3% Deb. ... ... | 85¾ | 79 | 78½ | −1 |
| 4% Deb. ... ... | 109¾ | 104½ | 103 | −½ |
| 5% Red. Deb. (1947) | 116¼ | 110½ | 112½ | — |
| 4½% Sinking Fund Red. Deb. | 111½ | 107½ | 109½ | — |
| SOUTHERN | | | | |
| Pref. Ord. ... | 98¾ | 82½ | 98 | — |
| Def. Ord. ... | 27⅝ | 20⅛ | 26½ | — |
| 5% Prefce. ... | 120¾ | 118½ | 121½ | −1½ |
| 5% Red. Pref. (1964) | 119¾ | 115¼ | 117½ | — |
| 5% Guar. Prefce. | 136 | 129½ | 130 | −1 |
| 5% Red. Guar. Pref. (1957) | 120 | 115¾ | 117½ | — |
| 4% Deb. ... ... | 117 5/16 | 109½ | 108 | −1 |
| 5% Deb. ... ... | 140 | 134 | 131½ | −3 |
| 4% Red. Deb. 1962–67 | 116½ | 110 | 111½ | −1 |
| BELFAST & C.D. | | | | |
| Ord. ... ... | 9 | 4½ | 5 | — |
| FORTH BRIDGE | | | | |
| 4% Deb. ... ... | 107 | 105 | 104½ | — |
| 4% Guar. ... | 107 5/16 | 104 | 104½ | — |
| G. NORTHERN (IRELAND) | | | | |
| Ord. ... ... | 19½ | 9¾ | 10 | −2 |
| G. SOUTHERN (IRELAND) | | | | |
| Ord. ... ... | 63 | 41 | 49½ | −½ |
| Prefce. ... ... | 65 | 46 | 60 | +2 |
| Guar. ... ... | 97¼ | 81 | 94½ | — |
| Deb. ... ... | 99¾ | 83¼ | 93 | — |
| L.P.T.B. | | | | |
| 4½% "A" ... | 127¾ | 121 | 120½ | −1 |
| 5% "A" ... | 138¼ | 133½ | 130½ | −2 |
| 4½% "T.F.A." ... | 111½ | 108⅛ | 107 | — |
| 5% "B" ... | 131¾ | 123¾ | 121½ | −1 |
| "C" ... ... | 112½ | 93 | 97 | — |
| MERSEY | | | | |
| Ord. ... ... | 40¾ | 23 | 39½ | — |
| 4% Perp. Deb. ... | 103 | 98 | 100 | — |
| 3% Perp. Deb. ... | 78 | 74⅝ | 76½ | — |
| 3% Perp. Prefce. | 68⅞ | 63¼ | 67½ | — |

* ex dividend

# CONTRACTS AND TENDERS

The Sentinel Waggon Works (1936) Ltd. has received a repeat order from the Crown Agents for the Colonies for three articulated steam railcars for service on the metre-gauge lines of the Federated Malay States Railways.

D. Wickham & Co. Ltd. has received an order from the South African Government Railways for 32 double-geared pump trolleys required for permanent-way maintenance.

Wm. Beardmore & Co. Ltd. has received an order from the Chinese Government Purchasing Commission to the inspection of Messrs. Sandberg for 35 carriage axles, and to the inspection of Messrs. Fox & Mayo for 14 wagon axles for the Canton-Hankow Railway.

The General Electric Co. (India) Ltd. has received an order from the Indian Stores Department for rotary converters, transformers, and switchgear, at a total price of Rs.45,546, delivery free and including erection.

The Quasi Arc Co. Ltd. has received an order from the Great Western of Brazil Railway for two single operator motor generator welding sets with accessories and spares.

The directors of the Great Western Railway have authorised the placing of the following contracts :—

Ransomes & Rapier Limited : Supply of a petrol-electric mobile crane for Hockley (Birmingham) goods station.

Demolition & Construction Co. Ltd. : Reconstruction and lengthening of Shoddesden Bridge, near Weyhill, Hants.

H. Covington & Sons Ltd. : Dredging of Brentford dock and Chelsea dock and creek.

*Supply of the following equipment for Swindon works :—*

D. Etchells & Sons Ltd. : One nut-forging machine.

Wilkins & Mitchell : One four-head drilling machine.

J. Parkinson & Son : One horizontal knee-type drilling machine.

J. Archdale & Co. Ltd. : One vertical knee-type milling machine.

R. Wright & Partners Limited has received an order from the Indian Stores Department for 15 crank axles at a total price of Rs.29,775.

Krupp India Trading Co. Ltd. has received an order from the Indian Stores Department for 581 steel tyres at a total price of Rs.72,757, and 600 chilled cast-iron wheels at a total price of Rs.13,500.

Guest Keen, Williams Limited has received an order from the Indian Stores Department for 11 crank axles, at a total price of Rs. 22,056.

Shaw, Wallace & Co. Ltd. has received an order from the Indian Stores Department for 250 carriage and wagon straight axles at a total price of Rs.40,062.

The South Indian Railway Administration has placed orders to the inspection of Messrs. Robert White & Partners with Thomas Bolton & Sons Ltd. for 4½ tons of copper rods, and with John Lysaght & Co. Ltd. for steel panel sheets.

Soc. Anglo-Franco-Belge de Materiel de Chemins de fer has received an order from the Great Western of Brazil Railway for 36 locomotive tender tanks.

Matheson & Co. Ltd., London, acting as purchasing agent for the Ministry of Railways, China, under the King-Kan Railway Loan Agreement, has placed orders for a total of 41,192 tons of 35 kg. per metre FF. rails, 2,219 tons of fishplates and 646 tons of tieplates, together with orders for dogspikes and jointspikes, to be supplied to the inspection of Messrs. Sandberg and divided as follows :—

Barrow Hæmatite Steel Co. Ltd., 5,743 tons rails and 300 tons fishplates.

Colvilles Limited, 6,339 tons rails and 646 tons tieplates.

Dorman Long & Co. Ltd., 15,323 tons rails and 955 tons fishplates.

Guest Keen, Baldwins Iron & Steel Co. Ltd., 696 tons fishplates.

Lancashire Steel Corporation, 4,055 tons rails.

Skinningrove Iron & Steel Co. Ltd., 4,000 tons rails.

United Steel Companies Ltd. (Workington Iron & Steel branch), 5,732 tons rails and 268 tons fishplates.

Guest Keen & Nettlefolds Limited, 458,000 fishbolts and nuts, 3,490,000 dogspikes, and 393,000 jointspikes required for the above rails.

The Tata Iron & Steel Co. Ltd. has received an order from the Indian Stores Department for approximately 11,351 cwt. of galvanised corrugated sheets.

The Consolidated Pneumatic Tool Co. Ltd. has received an order from the Great Western of Brazil Railway for a quantity of pneumatic hammers, drills, and grinders.

T. Robinson & Son Ltd. has received an order for wood-working machinery for the Parana workshops, Entre Rios Railways.

The Drewry Car Co. Ltd. has received an order for one 30-b.h.p. diesel locomotive for Admiralty service at Trincomalee, Ceylon.

The British Oxygen Co. Ltd. has received an order from the Great Western of Brazil Railway for acetylene generating plant and spares.

The Drewry Car Co. Ltd. has received an order from the Crown Agents for the Colonies for two Gardner-engined conversion sets required for the conversion of two existing Drewry petrol railcars to diesel propulsion in Iraq.

J. Westwood & Co. Ltd. has received an order from the Central Uruguay Railway for two steel plate girder deck spans of 72-ft. clear span.

Scandia Limited has received orders from the Danish State Railways for 24 passenger coaches, six travelling Post Office vans and a new royal coach. The 24 passenger coaches will comprise 16 first-class and eight combined first and common class coaches. They will all be of the all-steel welded type and the first-class will have side corridors. The new royal coach will be the longest in use on the State Railways and will also be of all-steel construction. This order amounts in total value to about Kr. 34,000,000.

Burn & Co. has received an order from the Stores Purchasing Committee, Government of Mysore, Bangalore, for one 56-ft. bogie carriage underframe for metre-gauge with four-wheeled bogies, steel and iron work for underframes, dynamos and accumulator boxes, and vacuum brake ; two bogie carriage underframes with vacuum and hand brakegear, and two bogie carriage underframes without dynamos, and accumulator boxes at a total price of Rs. 39,235.

S.P.C. (England) Limited has received an order for 108 Standage couplings required to transmit the drive between the forward and reverse gear boxes on the railcars for which, as recently announced, the Drewry Car Co. Ltd. has received orders from the Buenos Ayres Great Southern and Buenos Ayres Western Railways.

The Hydraulic Coupling & Engineering Co. Ltd., of Isleworth, has received an order for two traction-type hydraulic couplings to suit the 150-b.h.p. Gardner engines being fitted to War Office locomotives by Andrew Barclay, Sons, & Co. Ltd., and two 50-b.h.p. couplings for Drewry locomotives for the Eagle Oil Company.

A/S. Frichs, of Aarhus, has received a repeat order from the Danish State Railways for eight double-bogie diesel-electric railcars of 500/550-b.h.p. The order includes spare bogies and is valued at 2·4 million kroner. Delivery is required by April, 1938. These railcars are arranged for working in multiple-unit and can be used for local stopping trains or fast expresses.

The Danish State Railways are considering the purchase from the Swedish State Railways of 11 steam locomotives which, in view of the extended electrification on that system, will not be required by the Swedish Administration. The price per engine is understood to be approximately Kr. 25,000.

Tenders are invited by the South Indian Railway, receivable by February 12 at 91, Petty France, Westminster, London, S.W.1, for the supply of fan bolts and dogspikes.

Matheson & Co. Ltd., London, invites tenders, receivable by February 16, for the supply of 55 spans of bridge work, required to the order of the Ministry of Railways, China, under the King-Kan Railway Loan Agreement.

Tenders are invited by the Chief Controller of Stores, Indian Stores Department, New Delhi, receivable on the dates named, for the under-mentioned materials :—

Mild steel cotters and split pins required for the State Railways at Calcutta, Bombay and Storespura (North Western Railway) during the period May 16, 1937–May 15, 1938 (February 19).

Forged crank axles for SP, SG, PT-c, PT-S, SP-S, SG-C, SG-S, class locomotives (March 4).

36,795 ft. of indiarubber hoses of sizes (March 11).

# OFFICIAL NOTICES

**South Indian Railway Co. Ltd.**

THE Directors are prepared to receive Tenders for the supply of :—

ROLLED STEEL DISC WHEELS AND AXLES.

Specifications and Forms of Tender will be available at the Company's Offices, 91, Petty France, Westminster, S.W.1.

Tenders addressed to the Chairman and Directors of the South Indian Railway Company, Limited, marked "Tender for Rolled Steel Disc Wheels & Axles," with the name of the firm tendering, must be left with the undersigned not later than 12 noon, Friday, the 19th February, 1937.

The Directors do not bind themselves to accept the lowest or any tender.

A charge, which will not be returned, will be made of £1 for each copy of the Specification.

Copies of the Drawings may be obtained at the Offices of the Company's Consulting Engineers, Messrs Robert White & Partners, 3, Victoria Street, S.W.1.

E. A. S. BELL,
Managing Director.

91, Petty France,
Westminster, S.W.1.
3rd February, 1937.

THE MADRAS & SOUTHERN MAHRATTA RAILWAY COMPANY, LIMITED, invite Tenders for :—

COPPER RODS, TUBES AND SHEETS.

Specification and Form of Tender can be obtained at the Company's Offices, 25, Buckingham Palace Road, Westminster, London, S.W.1.

Fee ONE GUINEA, *which will not be returned.*

Tenders must be submitted not later than 2 o'clock p.m. on TUESDAY, 16TH FEBRUARY, 1937.

The Directors do not bind themselves to accept the lowest or any Tender and reserve to themselves the right of reducing or dividing the order.

By Order of the Board,
G. W. V. DE RHE PHILIPE,
Secretary.

ENGINEER, 37, Public School, apprenticeship Railway Loco. Works, subsequent experience, Factory Management, Costing, Office Organisation and Technical Sales, seeks position in Engineering or similar concern where his experience would be of value.—Box No. 3, THE RAILWAY GAZETTE, 33, Tothill Street, London, S.W.1.

THE owners of Patent No. 392,050, which relates to Guards for Crossing Highways and Railway Level Crossings, wish to enter into negotiations either for the grant of licences or for the sale of the patent. Enquiries should be addressed in the first place to ANDREWS & BYRNE, 329, High Holborn, London, W.C.1.

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## Eastern Divisional Engineer's Staff Dinner, S.R.

Mr. H. E. Robarts, Divisional Engineer, presided over the annual dinner of his staff at Ashford on February 3. Among those present were :—

Messrs. A. E. Brounger, G. Cheale, J. T. Cloke, R. N. Cloke, S. W. J. Denness, C. V. Hill, J. H. Knotts, J. Latham, W. A. Messer, P. Nunn, E. A. Rampton, W. Redding, L. G. B. Rock, H. V. Russ, J. Shaw, C. F. Tofts, A. E. Usherwood, W. A. Willox, and F. J. Wymer.

Mr. Denness, in proposing the toast of "The Chairman" referred to Mr. Robarts's popularity with his staff and his conspicuous ability in combining sympathetic and just dealing with efficient administration. Mr. Robarts, in response, expressed his pleasure at attending this annual social function which enabled him to tell all the various sections of his staff how highly he valued their co-operation. Although the outdoor staff produced the more spectacular results, the indoor staff was no less indispensable in enabling him to keep his finger on the pulse of the whole organisation and to watch over its health.

Mr. R. N. Cloke proposed the toast of "The Guests" among whom he was glad to see members of the other departments whose daily work was closely interwoven with their own. It was a tribute to the amicable relations that existed between the various departments that they fraternised so happily after working hours, as their presence at this dinner testified. Mr. P. Nunn and Mr. C. V. Hill briefly responded.

## "The Great Barrier"

If one thing stands out more vividly than another in this remarkable film of the building of the Canadian Pacific Railway through the Rockies 50 years ago, it is the heroic work of the pioneers —engineers and workmen—in conquering the Hindenburg line of Nature. The quick changes of scene from the perilous physical struggle to the board room at Montreal, where the money control is exercised, bring home dramatically to the spectator the peculiar relative valuations placed on human life and financial solvency.

Despite the full measure given of that inevitable ingredient "love," which is here in keeping with the wild and desolate background, there is much to rivet the interest of the railway fan. A train half engulfed in the musteg, a thrilling race on horseback to stop the following train before it should dash into the wreckage and endanger the hero's sweetheart, railway scenes of the time and of the line as it is to-day, are well worth the long intervening episodes of love and misunderstandings. Acting and photography are on a high standard and a visit to the new Gaumont Theatre in Haymarket, London, where the picture is now being shown, may be confidently recommended.

## Forthcoming Events

Feb. 5 (*Fri.*).—G.W.R. (London) Chief Goods Manager's Office, at Chiltern Hall, Chiltern Court Restaurant, Baker Street, N.W.1. Annual Dinner.
Institute of Transport (Leeds), at Town Hall, 6.30 p.m. "Post Office Motor Transport," by Capt. A. Hudson.
Feb. 8 (*Mon.*).—Institute of Transport (London), at Inst. of Electrical Engineers, Savoy Place, W.C.2, 5.30 p.m. "Transport and Distribution of Coal : Methods in the United Kingdom and Abroad Compared," by Mr. C. Sherrington.
Railway Students' Association (Edinburgh), at Goold Hall, St. Andrew Square, 8 p.m., "Brake Trains," by Mr. R. Morgan.
Stephenson Locomotive Society (London), at L.N.E.R. Dining Club, King's Cross Station, N.1, 6.30 p.m. "David Jones and his Highland Railway Locomotives," by Mr. D. S. Barrie.
Rail-borne Coal Factors' and Wholesa'e Merchants' Association, at Grosvenor House. Annual Dinner.
Feb. 9 (*Tues.*).—Institute of Transport (Birmingham), at Queen's Hotel, 6 p.m. "Selling Rides to Bus Passengers," by Mr. M. Somerfield.
Institute of Transport (Nottingham Graduate), at Guildhall, 7 p.m. "Imperia Airways," by Mr. E. Gorton.
Permanent Way Institution (Sheffield), at Royal Victoria Hotel, 7 p.m. "A Journey in Scandinavia," by Mr. W. A. Willox.
Feb. 10 (*Wed.*).—Diesel Engine Users' Association, at Pagani's Restaurant, Great Portland Street, London, W.1. Annual Dinner.
Institute of Transport (Manchester-Liverpool Graduate), at Central Library, Manchester, 6.30 p.m. Institute Examination Questions. Discussion.
Institute of Welding (London), at Inst. of Mechanical Engineers, Storey's Gate, S.W.1, 6.30 p.m. "Working Data on the Cutting of Steel by the Oxygen Jet," by Mr. N. Daniel.
Institute of Welding (Scottish), at Royal Philosophical Inst., 207, Bath Street, Glasgow, 7.30 p.m. "Welding of Ferrous and Non-Ferrous Alloys by Oxy-Acetylene," by Mr. A. Stokes.
Institution of Heating and Ventilating Engineers (London), at Inst. of Mechanical Engineers, Storey's Gate, S.W.1, 2.30 p.m. "Thermal Conductivity of Insulating Materials and Methods of Testing," by Mr. E. Griffiths. Annual Dinner, at Connaught Rooms, Great Queen Street, W.C.2, 6.30 for 7 p.m.
L.N.E.R. (Darlington) Lecture and Debating Society, at North Road Inst., 7.30 p.m. "A Visit to the American Railroads," by Mr. C. Sherrington.
Permanent Way Institution (London), at Underground Railways' Dining Club, Pelham Street, S.W.7, 7 p.m. "Some Aspects and Problems Connected with the Conveyance of Out-of-Gauge and Exceptional Loads," by Mr. H. Bussell.
Permanent Way Institution (Newcastle), at Mining Inst., Westgate Road, 7 p.m. "The 'Inside' Man's Point of View," by Mr. J. Burton.
Southern Railway Eastern Divisional Locomotive Running Department, at Strand Palace Hotel, London, W.C.2, 6.30 for 7 p.m. Annual Dinner.
Feb. 11 (*Thurs.*).—Institute of Metals (London), at Society of Motor Manufacturers, 83, Pall Mall, S.W.1, 7.30 p.m. "The Constitution of Alloys," by Mr. C. Desch.
Institute of Welding (Liverpool), at City Technical College, Byrom Street, 7.30 p.m. "Notes on Arc Welding," by Mr. E. Davies.
Institute of Locomotive Engineers (London), at Inst. of Mechanical Engineers, Storey's Gate, S.W.1, 6 p.m. Discussion: "What is the Best Training for Locomotive Engineers."
Feb. 12 (*Fri.*).—Institute of Transport (Leeds Graduate), at City Transport Department, 7 p.m. "'Safety First' in Relation to Passenger Transport," by Mr. A. Scott.
Institute of Transport (Newcastle), at Royal Station Hotel, 7.30 p.m. "Some Aspects of the Road Traffic Acts," by Mr. F. Milton.
Institute of Transport (Newcastle Graduate), at Royal Station Hotel, 6 p.m. "Conveyance of Out-of-Gauge Loads," by Mr. T. Appleyard.

# Railway Share Market

Sentiment in the stock and share markets generally has benefited from the stronger tone in British Government securities. Home railway stocks were moderately better in price, awaiting the forthcoming dividend decisions. The traffic figures were again disappointing, but the fact that they show an aggregate increase of £13,000, despite a decline of £36,000 in receipts from coal, was regarded as not unsatisfactory. Before long traffics should be of a more favourable character as comparison will no longer be with the period last year when there were exceptionally large movements of coal.

L.M.S.R. ordinary was firmer at 32¼ following the announcement of a traffic gain of £17,000 for the past week, but chief interest appeared to centre on the 4 per cent. and 1923 preference stocks on account of the attractive yields offered, and they came in for good demand on any reaction in prices. Great Western ordinary was dull at 62¾ on the traffic decrease of £7,000. L.N.E.R. first and second preference were firmer (traffics improved by £7,000 last week) and the last named stock had the appearance of receiving more attention in advance of the dividend announcement; although there is uncertainty in the market whether a small payment will be forthcoming, particularly as the directors might be influenced in their decision by the aggregate decrease of £38,000 shown in traffics for the current year to-date. It is realised that the further large expansion of industrial activity in the north-east coast area should before long benefit the railway more fully. Southern preferred continued in favour on account of the favourable yield at the current price of 98, but the deferred was dull around 26¼, the traffic decrease of £4,000 for the past week being disappointing. Debenture stocks were firmer in sympathy with British Government securities.

Argentine railway stocks did not keep best prices, but the preference and ordinary stocks of both the Central Argentine and B.A. Gt. Southern continued to show activity, buyers being in evidence on any reaction as improvement in traffics is expected to continue. B.A. Western ordinary and preference received more attention. Cordoba Central debentures were better. Elsewhere, San Paulo was reactionary as were Antofagasta preference and Nitrate Rails ordinary. Canadian Pacific made better prices.

## Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

| | Railways | Miles open 1935-36 | Week Ending | Traffics for Week: Total this year | Traffics for Week: Inc. or Dec. compared with 1935 | No. of Weeks | Aggregate Traffics to Date: Totals: This Year | Aggregate Traffics to Date: Totals: Last Year | Aggregate Traffics to Date: Increase or Decrease | Shares or Stock | Prices: Highest 1936 | Prices: Lowest 1936 | Prices: Feb. 3, 1937 | Yield (See Note) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | £ | £ | | £ | £ | £ | | | | | |
| South & Central America. | Antofagasta (Chili) & Bolivia | 834 | 31.1.37 | 15,730 | + 950 | 5 | 66,340 | 70,460 | − 4,120 | Ord. Stk. | 25 | 15¼ | 27½ | Nil |
| | Argentine North Eastern | 753 | 30.1.37 | 8,102 | + 969 | 31 | 278,659 | 243,532 | + 35,127 | „ | 12 | 2 | 13½ | Nil |
| | Argentine Transandine | — | — | — | — | — | — | — | — | A. Deb. | 54 | 45 | 88½ | 4½ |
| | Bolivar | 174 | Dec., 1936 | 5,600 | + 900 | 52 | 74,200 | 71,300 | + 2,900 | 6 p.c. Deb. | 9 | 5 | 7½ | Nil |
| | Brazil | — | — | — | — | — | — | — | — | Bonds. | 16 | 11½ | 16½ | 3 |
| | Buenos Ayres & Pacific | 2,806 | 30.1.37 | 112,221 | + 17,333 | 31 | 2,552,710 | 2,393,991 | + 158,719 | Ord. Stk. | 171½ | 6 | 14½ | Nil |
| | Buenos Ayres Central | 190 | 16.1.37 | $153,900 | + $46,700 | 29 | $4,176,200 | $3,454,300 | + $721,400 | Mt. Deb. | 31½ | 11 | 30½ | Nil |
| | Buenos Ayres Gt. Southern | 5,084 | 30.1.37 | 231,762 | + 83,525 | 31 | 4,041,271 | 3,832,686 | + 208,585 | Ord. Stk. | 31¾ | 13⅝ | 32 | Nil |
| | Buenos Ayres Western | 1,930 | 30.1.37 | 68,672 | + 12,973 | 31 | 1,426,877 | 1,323,181 | + 103,696 | „ | 29¾ | 11 | 26½ | Nil |
| | Central Argentine | 3,700 | 30.1.37 | 189,870 | + 43,213 | 31 | 4,505,037 | 3,725,213 | + 779,824 | „ | 32932 | 8⅝ | 30 | Nil |
| | Do. | — | — | — | — | — | — | — | — | Dfd. | 21 | 4½ | 17 | Nil |
| | Cent. Uruguay of M. Video | 273 | 23.1.37 | 13,857 | + 1,005 | 30 | 368,415 | 303,927 | + 64,488 | Ord. Stk. | 7¾ | 3 | 10 | Nil |
| | Do. Eastern Extn. | 311 | 23.1.37 | 2,794 | − 11 | 30 | 63,202 | 55,804 | + 7,398 | — | — | — | — | — |
| | Do. Northern Extn. | 185 | 23.1.37 | 1,562 | − 27 | 30 | 42,780 | 40,164 | + 2,616 | — | — | — | — | — |
| | Do. Western Extn. | 211 | 23.1.37 | 1,037 | − 51 | 30 | 29,210 | 25,217 | + 3,993 | — | — | — | — | — |
| | Cordoba Central | 1,218 | 30.1.37 | 31,270 | + 3,010 | 31 | 1,004,830 | 912,350 | + 92,480 | Ord. Inc. | 5 | 1 | 5½ | Nil |
| | Costa Rica | 188 | Nov., 1936 | 19,592 | + 6,242 | 22 | 91,581 | 68,099 | + 22,882 | Stk. | 36½ | 32 | 36 | 3916 |
| | Dorada | 70 | Dec., 1936 | 17,400 | + 3,400 | 52 | 173,900 | 144,700 | + 29,200 | 1 Mt. Db. | 107 | 101½ | 104½ | 5¾ |
| | Entre Rios | 810 | 30.1.37 | 16,129 | + 5,765 | 31 | 407,914 | 348,036 | + 59,878 | Ord. Stk. | 17 | 6 | 15 | Nil |
| | Great Western of Brazil | 1,082 | 30.1.37 | 9,900 | − 1,400 | 5 | 42,500 | 48,400 | − 5,900 | Ord. Sh. | 1/2 | 3/16 | 5/4 | Nil |
| | International of Cl. Amer. | 794 | Dec., 1936 | $461,490 | + $2,875 | 52 | $5,112,141 | $4,717,456 | + $394,685 | — | — | — | — | — |
| | Interoceanic of Mexico | — | — | — | — | — | — | — | — | 1st Pref. | 1/2 | -/6 | 1/2 | Nil |
| | La Guaira & Caracas | 22¾ | Jan., 1937 | 6,270 | + 1,845 | 5 | 6,270 | 4,425 | + 1,845 | Stk. | 9 | 3 | 7½ | Nil |
| | Leopoldina | 1,918 | 30.1.37 | 23,600 | − 743 | 5 | 94,120 | 86,498 | + 7,622 | Ord. Stk. | 10½ | 3½ | 7½ | Nil |
| | Mexican | 483 | 21.1.37 | $284,300 | + $37,000 | 3 | $837,600 | $716,800 | + $120,800 | „ | 1¼ | 1/4 | 1½ | Nil |
| | Midland of Uruguay | 319 | Dec., 1936 | 8,764 | + 814 | 26 | 49,941 | 39,314 | + 10,627 | „ | 1½ | 1/8 | 1/2 | Nil |
| | Nitrate | 397 | 31.1.37 | 5,294 | − 3,814 | 5 | 12,075 | 19,059 | − 6,984 | Ord. Sh. | 63/6 | 41/9 | 2/8 | Nil |
| | Paraguay Central | 274 | 30.1.37 | $3,321,000 | + $1,106,000 | 31 | $81,637,000 | $69,759,000 | + $11,878,000 | Pr. Li. Stk. | 85 | 71 | 81 | 7/5 |
| | Peruvian Corporation | 1,059 | Dec., 1936 | 81,512 | + 3,005 | 26 | 490,785 | 454,297 | + 36,488 | Pref. | 15 | 9 | 13 | Nil |
| | Salvador | 100 | 23.1.37 | ¢42,250 | + ¢7,000 | 30 | ¢505,008 | ¢482,696 | + ¢22,312 | Pr. Li.Db. | 18 | 16 | 21½ | Nil |
| | San Paulo | 153¼ | 24.1.37 | 28,591 | − 1,391 | 4 | 107,404 | 107,209 | + 195 | Ord. Stk. | 86 | 46½ | 87½ | 2/8 |
| | Taltal | 164 | Dec., 1936 | 4,090 | + 35 | 26 | 20,900 | 20,700 | + 200 | Ord. Sh. | 1/32 | 14/- | 1/4 | 8 |
| | United of Havana | 1,353 | 30.1.37 | 34,316 | + 5,244 | 31 | 520,649 | 498,636 | + 22,013 | Ord. Stk. | 3/4 | 1 | 4½ | Nil |
| | Uruguay Northern | 73 | Dec., 1936 | 1,442 | + 327 | 26 | 6,481 | 4,830 | + 1,651 | Deb. Stk. | 5 | 3 | 8 | Nil |
| Canada. | Canadian National | 23,564 | 21.1.37 | 659,070 | + 74,430 | 3 | 1,891,991 | 1,708,043 | + 183,947 | — | — | — | — | — |
| | Canadian Northern | — | — | — | — | — | — | — | — 4 p.c. | Perp. Dbs. | 76 | 51 | 76½ | 5¼ |
| | Grand Trunk | — | — | — | — | — | — | — | — | 4 p.c. Gar. | 104¾ | 99¾ | 101½ | 3916 |
| | Canadian Pacific | 17,223 | 21.1.37 | 474,200 | + 40,600 | 3 | 1,388,400 | 1,244,200 | + 144,200 | Ord. Stk. | 16¾ | 1015/16 | 17 | Nil |
| India.† | Assam Bengal | 1,329 | 10.1.37 | 39,892 | + 3,693 | 40 | 1,022,192 | 970,422 | + 51,770 | Ord. Stk. | 87¾ | 82¼ | 83½ | 3916 |
| | Barsi Light | 202 | 10.1.37 | 2,917 | − 1,260 | 40 | 90,083 | 110,805 | − 20,722 | Ord. Sh. | 77½ | 65½ | 64¼ | 7¾ |
| | Bengal & North Western | 2,107 | 10.1.37 | 79,394 | − 2,856 | 14 | 768,926 | 722,641 | + 46,285 | Ord. Stk. | 319 | 292⅝ | 312 | 5¾ |
| | Bengal Dooars & Extension | 161 | 10.1.37 | 2,976 | − 919 | 40 | 104,520 | 110,814 | − 6,294 | „ | 127½ | 118 | 114½ | 6/8 |
| | Bengal-Nagpur | 3,268 | 10.1.37 | 135,875 | − 52,616 | 40 | 4,598,856 | 4,966,764 | − 367,908 | „ | 104 | 100¼ | 100½ | 4 |
| | Bombay, Baroda & Cl. India | 3,072 | 20.1.37 | 307,500 | + 55,500 | 41 | 6,866,175 | 6,498,750 | + 367,425 | „ | 114 | 110½ | 110½ | 5716 |
| | Madras& Southern Mahratta | 3,229 | 10.1.37 | 178,050 | + 20,292 | 40 | 4,306,943 | 4,158,157 | + 148,786 | „ | 116½ | 108½ | 109½ | 7516 |
| | Rohilkund & Kumaon | 572 | 10.1.37 | 17,118 | − 952 | 14 | 139,512 | 133,465 | + 6,047 | „ | 311 | 286 | 310 | 5316 |
| | South Indian | 2,532 | 10.1.37 | 107,871 | − 2,308 | 40 | 3,122,910 | 3,072,392 | + 50,518 | „ | 107½ | 1025/16 | 101½ | 5718 |
| Various | Beira-Umtali | 204 | Nov., 1936 | 68,789 | + 4,610 | 9 | 137,294 | 129,925 | + 7,368 | — | — | — | — | — |
| | Bilbao River & Cantabrian | 15 | Dec., 1936 | 1,128 | − 388 | 52 | 16,077 | 18,470 | − 2,393 | — | — | — | — | — |
| | Egyptian Delta | 620 | 20.1.37 | 7,537 | + 215 | 41 | 206,078 | 205,213 | + 865 | Prf. Sh. | 21¼ | 15⅜ | 15⅜ | 6116 |
| | Great Southern of Spain | 104 | 29.8.36 | 568 | − 2,514 | 35 | 33,629 | 62,623 | − 28,994 | Inc. Deb. | 11/2 | 1/8 | 3½ | Nil |
| | Kenya & Uganda | 1,625 | Dec., 1936 | 207,131 | + 8,585 | 52 | 2,526,328 | 2,384,923 | + 141,405 | — | — | — | — | — |
| | Manila | — | — | — | — | — | — | — | — | B. Deb. | 50½ | 37 | 47 | 7716 |
| | Mashonaland | 913 | Nov., 1936 | 120,282 | + 18,583 | 9 | 245,549 | 213,702 | + 31,847 | 1 Mg. Db. | 105½ | 1015/16 | 106 | 4116 |
| | Midland of W. Australia | 277 | Dec., 1936 | 14,803 | − 39 | 26 | 82,053 | 83,623 | − 1,570 | Inc. Deb. | 97 | 93½ | 96 | 4/8 |
| | Nigerian | 1,900 | 12.12.36 | 79,270 | + 5,967 | 36 | 1,508,333 | 1,191,394 | + 316,939 | — | — | — | — | — |
| | Rhodesia | 1,538 | Nov., 1936 | 213,377 | + 25,550 | 9 | 443,341 | 390,521 | + 52,820 | 4 p.c. Db. | 107 | 103½ | 108 | 3116 |
| | South Africa | 13,263 | 9.1.37 | 595,926 | + 35,431 | 41 | 24,948,681 | 23,130,432 | + 1,818,249 | — | — | — | — | — |
| | Victoria | 4,728 | Sept., 1936 | 790,314 | + 984 | 13 | 2,242,629 | 2,238,853 | + 3,776 | — | — | — | — | — |
| | Zafra & Huelva | 112 | Nov., 1936 | 16,703 | + 6,796 | 48 | 97,316 | 124,029 | − 26,713 | — | — | — | — | — |

NOTE.—Yields are based on the approximate current prices and are within a fraction of 1/16.
† Receipts are calculated @ 1s. 6d. to the rupee. ‡ ex dividend. Salvador and Paraguay Central receipts are in currency.
The variation in Sterling value of the Argentine paper peso has lately been so great that the method of converting the Sterling weekly receipts at the par rate of exchange has proved misleading, the amount being overestimated. The statements from July 1 onwards are based on the current rates of exchange and not on the par value.

# Electric Railway Traction

## Moscow Metro Progress

AFTER a lapse of two years the second section of the Moscow underground is approaching completion, but probably it will be some little time before a regular service begins, although trial trains have been run over the extension of the Arbat line from the present terminus at Smolenskia Rinok to the Metro station adjacent to the Briansk (or Kiev) main-line terminus. In this short 1·7 km. section the line is mostly on the surface, and the Moscow river is crossed by a bridge. This line is to be extended further to Kutusovo. Experiments are being made on the elimination of noise in the tube sections, and in addition to measurements and trials in the tubes themselves a one-twentieth scale tunnel has been built for research. It is stated that the remaining portion of the second section, to be finished during 1937, comprises the lines from Manége to the Kursk main-line station, and from Sverdlovski Square to Sokolinaia Gora. The second part was not scheduled for early completion in the original programme, but the whole project of lines radiating from the neighbourhood of Ljubianka and the Bibliothika Lenina appears to have been modified considerably since L. M. Kaganovitch became Commissar of Transport, and the third section, for the beginning of which a sum of 50,000,000 roubles has been budgeted for 1937, is to be a loop line running from Krassnyia Vorota (Red Square) past the Kursk main-line station and under the river to the Paveletz main-line terminal and then turning north and burrowing under the river again to the Crimea Vorota and the Smolenskia district, a distance of six miles. Most of these places may be picked out in the map published on page 644 of the issue of this Supplement for October 19, 1934.

## Cleanliness and Acceleration

THE aspect of cleanliness which is characteristic of all electrified systems has been given prominence frequently in these pages, but we doubt whether steam railway authorities even now realise how potent a factor it is in bringing more traffic. Yet an idea of this increase can be gauged each day and almost all the day at London Bridge station on the Southern Railway. In the Eastern section of the station there is a large transfer traffic on platforms 4, 6 and 7 between incoming trains going to Charing Cross and Cannon Street. To the former station, especially, one frequently has the choice of a main line steam train or one of the normal suburban electrics. Should the two arrive together the steam train takes about 10 per cent. of the passengers and the electric about 90 per cent., and of the 10 per cent. that go to the steam train some nine-tenths are old ladies and gentlemen who rarely visit the station. It may be argued that this is partly due to the faster schedule speed of the electric train over the short distance involved, and undoubtedly it is—partly—for although the steam train may get the road first over the single up track between Borough Market and Metropolitan junction, the electric is invariably first into Charing Cross if both trains stop at Waterloo. We have even observed an instance where a following electric train re-started from the Waterloo stop three seconds before the steam train came to rest, the electric train having started and run from Borough Market to Waterloo, stopped and restarted, what time the 290-ton steam train, headed by one of the powerful "Schools" class locomotives, had run from Metropolitan junction (with a flying start) to its stop at Waterloo. The attraction of cleanliness is evident by the number of persons who will not use a steam train between London Bridge and Charing Cross, although an electric train may not be signalled. They prefer to lose three or four minutes, tramp over the bridge to another platform, and come clean, despite a larger number of passengers for a given number of seats.

## Electrification in Sweden

PRINCIPALLY from a traffic and operation viewpoint, the extensive electrified system of the Swedish State Railways is often held up as a model both of what an electrified railway should be and what it can do. Behind this picture lie a sound technical organisation and electrical equipment essentially suited to the requirements of the Swedish traffic, although they differ in certain respects, *e.g.*, the preference for rod-drive locomotives in place of nose-suspended or quill-drive motors, from modern single-phase practice in Central Europe. In this issue a comprehensive account of the distribution and converting equipment of the Swedish State Railways is published from the pen of the Chief Electrical Engineer, and it shows how the present successful system has been developed and troubles eliminated since the conversion of the first portion of the Lapland iron ore railway 22 years ago. The information given by Mr. Ofverholm goes far beyond the bounds of a normal description, and we believe that some of the figures and charts which he presents will be used widely as a basis for discussion or argument. When the present electrification programme of the Swedish State Railways is completed at the end of the present year the route mileage operated on the standard single-phase system will total 2,083, or 45 per cent. of the total length. Electric traction then will be used for 80 per cent. of the total traffic, and the entire current required will be generated in hydro-electric stations. Within the last five years the imported tonnage of locomotive coal for the Swedish State Railways has fallen from 400,000 tons p.a. to about 200,000 tons, and the whole electrification of the Swedish State system has saved more than this, for the Stockholm-Gothenburg and Lapland iron ore railways were electrified prior to 1932, and it is estimated that with the completion of the present programme the coal saved by the whole electrified system will amount to about 350,000 tons yearly. The traffic on the remaining steam lines could be worked, if necessary, on wood and peat fuel taken from the national forests and bogs, and Swedish railways thus would be rendered independent of foreign fuel supplies, a point which the experiences of 1914-18 forced into a cardinal position.

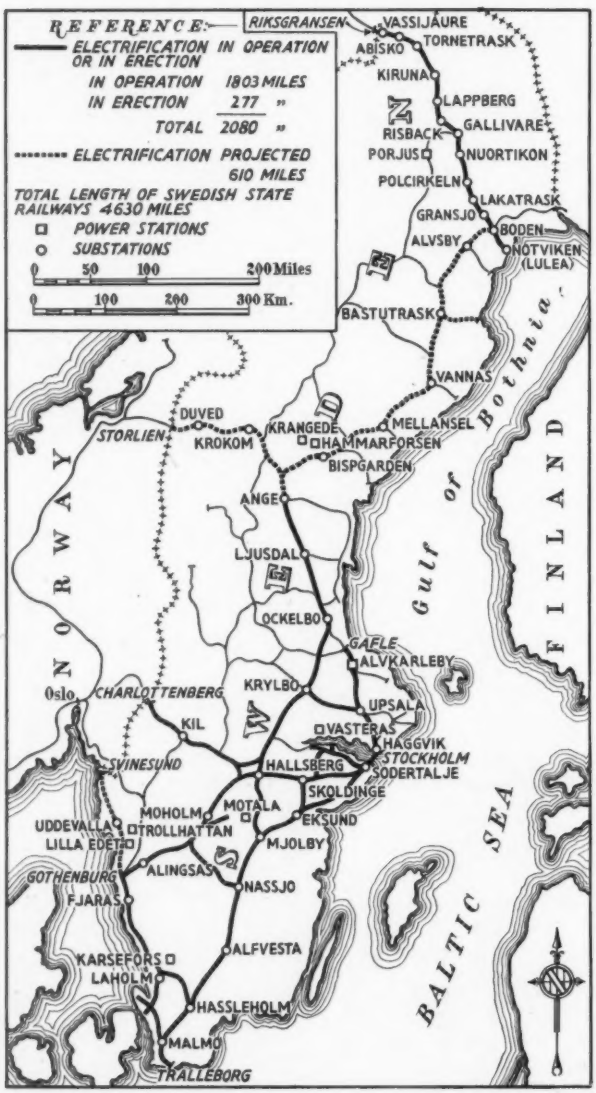
# THE SUBSTATIONS OF THE SWEDISH STATE RAILWAYS

*By I. ÖFVERHOLM, Chief Electrical Engineer, Swedish State Railways*

SINGLE-PHASE low frequency current at 16 kV. is used for the Swedish State Railways electrification.

When this system was adopted, it was considered that the railways should have their own generating plant and transmission lines in order to obtain the greatest possible reliability of service. The first railway to be electrified, the Ore railway between Luleå and Riksgränsen, was therefore supplied with current in this manner. Time has changed ideas, and the system of a special grid exclusively for the railways has become subject to much criticism not only in Sweden but also in the several other countries where single-phase railways are run.

The jesters contend that earth is surely not meant to look like a porcupine; no—one grid system is just as much as people can possibly stand. The reliability of service with a modern grid supply is so much improved that an independent system no longer can show any advantages in that direction. The railway load is further desirable to the three-phase system, where it is supplied over motor-alternators with possibilities for voltage regulation on the three-phase side. Other critics say that there is no economy in baking your own bread, if you can have it cheaper at the baker's. Three-phase power generated in bulk must surely in most cases be cheaper than single-phase generated separately, even taking into account losses in frequency changing.




*Map of Swedish State Railways' electrified lines, showing location of hydro-electric power stations and substations*

## Telephone Disturbance

Again, when considering further electrification, the railway experts were faced with the recommendation of the Swedish 1918 committee on telephone and telegraph disturbances along single-phase railways, that the feeding points for the railway contact wire ought not to be more than 20-25 miles apart. That meant a very large number of substations, all equipped with motor-alternators, and all operating to regulate the three-phase voltage. That is rather overdoing a good thing, especially as from the voltage drop point of view the distance between substations under Swedish conditions can be increased to 60-90 miles when the power is obtained from motor-alternators delivering current at a steady 16 kV.

The problem of telephone disturbances was again carefully investigated in the years 1920-1923, and this eventually led to the adoption of new methods, where it was no longer necessary to consider any restrictions with regard to the distance between substations. Spacings of 100 miles have been used, and it has been possible to one-way feed this length of line without disadvantages. This has made it possible to arrange the substations in such a manner that special three-phase feeding lines have not been required, as the stations have been able to take their supply straight off the existing grid. The savings thus obtained have assisted in making it an economically feasible proposition to use the frequency-changing system for the railway current supply.

On the Ore railway the trolley wire system was originally interconnected throughout, the idea being to reduce voltage drop and telephone interference. It was thus thought that when a locomotive was working between two transformer feeding points the current would be divided, forming two circuits inducing voltages cancelling each other in the communication lines. But it was found that when tried under actual working conditions this desirable effect was not obtained to a sufficient degree, and the disturbances caused by the short-circuits in the contact line system also made themselves felt all over the interconnected system. As a result the lines were shortly afterwards divided up between the substations, whereupon conditions very much improved. The voltage drop thereby naturally increased a little, and telephone interference was not compensated. In the meantime, however, more expedient methods of dealing with interference had been found, and were brought into use a little later on with good results.

The Ore railway is situated in the north of Sweden, in Lapland, where there is no three-phase grid due to the fact that the country is sparsely populated, the only

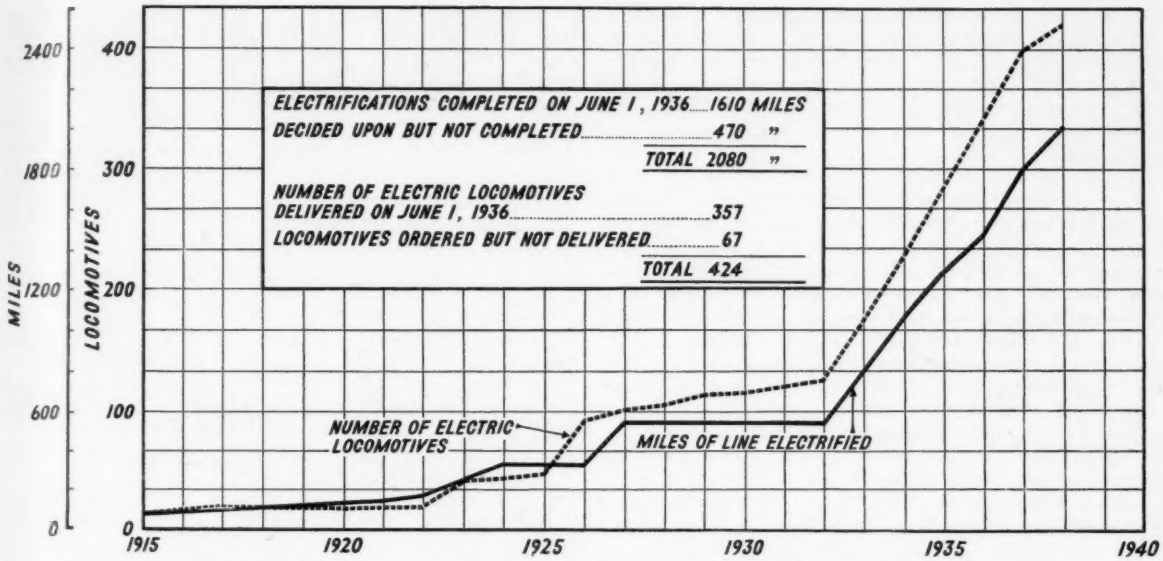
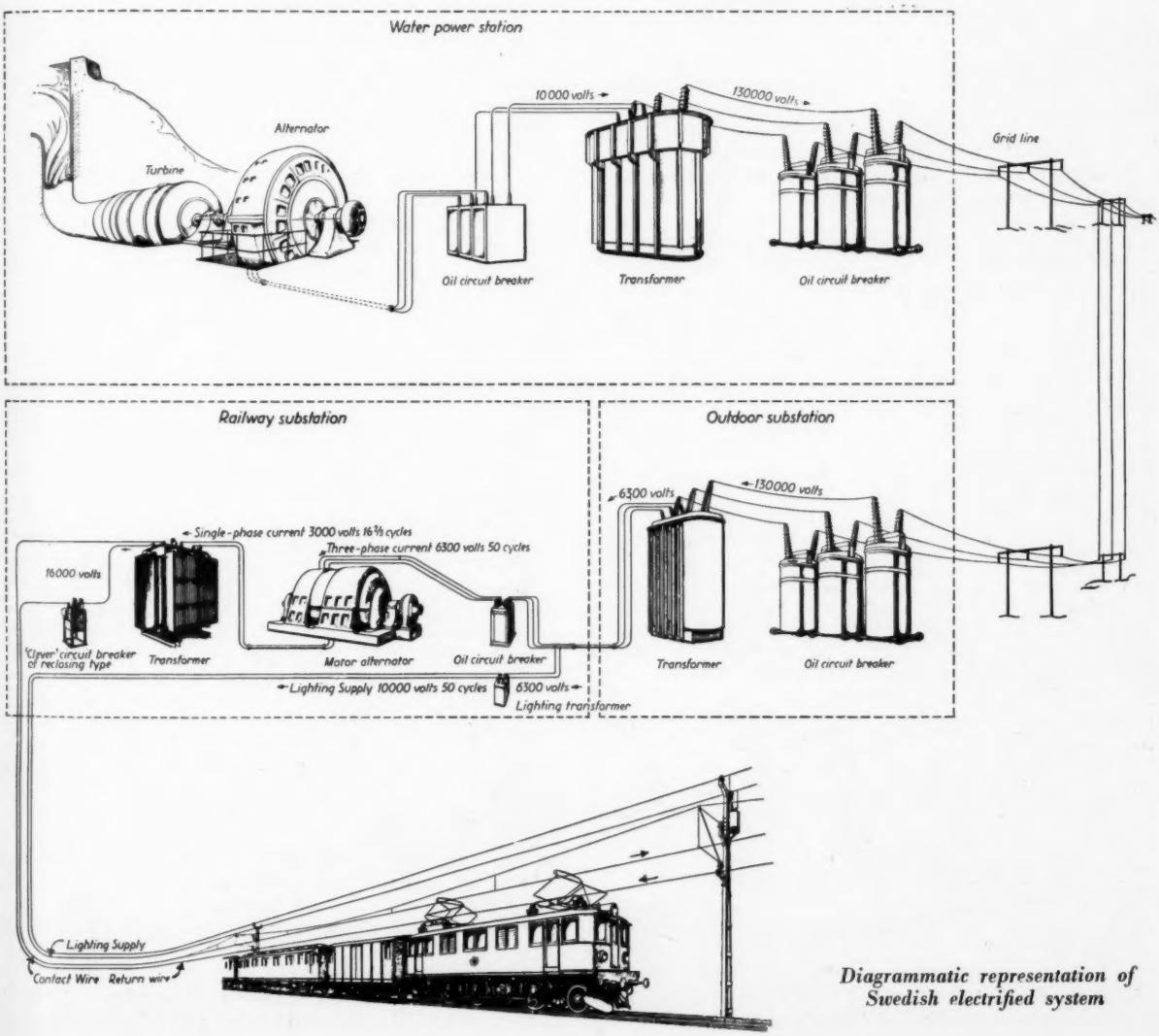



*Chart showing annual progress of electrification on the Swedish State Railways*




*Diagrammatic representation of Swedish electrified system*

large consumers of electrical energy being the ore mines in Kiruna and Gällivare. But when the electrification of the Stockholm—Gothenburg line was considered for the first time in 1920 the situation was quite different. There existed even then several grid branches stretching almost along the railway, and more were to be erected in the near future.

### The Grid Question

In the first project of 1920 the Railway Board suggested the use of a separate single-phase grid system for this electrification, as for the Ore railway. The substations would be spaced some 20-25 miles apart and were to be equipped with transformers for supplying the contact wire at 16 kV. The Board of Waterfalls objected to this scheme. It would have been very difficult and costly to house the special low-frequency alternators in the existing power stations, and a scheme embodying frequency conversion was shown to be more economical. If separate alternators were insisted upon space would have to be reserved for such machines in every power station, and it might even have been impossible to go on with the construction of new power stations until it had been decided to what extent they would be used to supply railway load. A committee was formed in 1920 to consider this problem, and after careful investigations and consultations with Swedish and foreign experts they put forward their recommendations in 1923. These were to the effect that in central and south Sweden the electrified railways should as a rule obtain their power from the grid system by means of frequency-changing.

The Railway Board then put forward a revised scheme for the Stockholm-Gothenburg electrification in which they fully agreed with the findings of the committee. The scheme was passed by Parliament in the same year. It was found later that with the new system of power supply one of the great problems of railway electrification in Sweden had been most satisfactorily solved. The second important difficulty, the interference with communication lines was disposed of finally with the arrangements made on the basis of the experience obtained and the researches accomplished on the Ore railway and at other places.

The system with motor-alternators has also proved very suitable for the continued electrification of the State Railways. Many important advantages have accrued in that the railway has become an ordinary consumer of electrical energy from the grid and is allowed to increase or decrease the amount of energy consumed, just as is required by the traffic. The system of frequency-converting was simplified by the fact that due to the reasons already stated, the substations operate separately from each other, and synchronisation of adjacent stations is not required. Line faults, which fortunately are rare, are with this system localised to their own substation, and automatic means for finding the faulty line section can be employed to a certain degree, utilising quite simple methods. The short-circuit current is further much smaller as compared with that of an interconnected system, and maintenance costs are thereby reduced for the line as well as for locomotives and motor-coaches. Finally, the supply system selected has had the unforeseen great advantage that it has allowed the rapid extension of railway electrification in Sweden which has taken place in recent years.

### The Substations and their Equipment

At the present time 21 railway substations are in service on the Swedish State Railways. Four different types of stations are used. The motor-alternators installed are all of the same output and differ only with regard to mounting, the first two types of substations being provided with stationary and the two later types with mobile sets.

*Overhead construction on the Swedish State Railways. Over the track is the contact wire carrying 16 kV. current; on the mast is a thick wire for the return current; and on the top of the mast is a lighting supply line carrying 10 kV. 50-cycle current*

The illustrations accompanying this article show the arrangement of the three types of substations that have hitherto been used. The five substations in Södertälje, Skäldinge, Hallsberg, Moholm, and Alingsås for the Stockholm-Gothenburg electrification were completed in 1924-1926 and made according to type I. The six following stations for the Malmö electrification were of type II and were completed in 1933. They are situated in Eksund, Mjölby, Nässjö, Alvesta, Hässleholm and Malmö. Six of these stations have three stationary motor-alternators, whilst five stations have two such sets. A total of 28 stationary sets are thus in use. The difference between substations of types I and II is only that certain floor space in type I was found not absolutely necessary, and has been left out in type II. The electrical apparatus has also been subject to alterations in certain minor respects.

The other substations are mostly of type III and provided with mobile motor-alternator sets housed in a kind of locomotive cab of the parallel type with space for three sets in each. The number of sets in each of these stations is varied to suit requirements from time to time. Up to date 22 mobile sets have been put in hand for the 9 substations which according to present plans are to be made of type III. Also in the older substations of type I and II arrangements have been made to house mobile spare sets.

Current is supplied to the railway substations through underground cables from the power producers' substations situated in their immediate vicinity. Transformers in the latter stations bring the grid voltage of 50, 70, 130, or 220 kV. down to the voltage for which the motors are wound. Apart from the motor-alternator load a certain amount of power is transmitted along the railway at 50 cycles and generally 10 kV. single-phase for lighting purposes, and in some special cases three-phase transmission is used at higher voltages up to 20 kV. for conveying larger amounts of 50-cycle power.

The motor-alternators run on three-phase 50-cycle current at 6·3 kV.—in one instance 5·25 kV.—and deliver

$16\frac{2}{3}$-cycle single-phase energy at 3 kV. Each set comprises a 12-pole motor rated at 3,200 kVA. 0·7 PF, one 4-pole alternator rated at 2,400 kVA. 0·8 PF, and two further exciters, one for the motor and one for the alternator, each rated 33 kW. at a maximum of 115 volts. Motor and alternator are of the synchronous type running at 500 r.p.m., and a common shaft supported in two bearings carries all four machines. The stators are fixed, as it has been found unnecessary to use the turnable type. The sets are each capable of dealing with single-phase overloads of up to 6,000 kVA.

The stationary type weighs, exclusive of the foundation plate, 66·4 tons, 26 tons being the weight of the rotating parts. The mobile type is mounted on a five-axle wagon, and weighs including all carriage details, 85·9 tons. As will be shown in the next instalment, the set does not consist of the ordinary stationary machines loaded on a wagon, for in order to reduce weight and space requirements the motor-generator has been reconstructed to be in itself a kind of wagon provided with wheels, buffers, hauling arrangements and other carriage auxiliaries. The rotating parts have been most carefully balanced to ensure smooth running, and the movements have proved to be negligible even on the heaviest short-circuits. This is really surprising, taking into account the weight of the rotating parts (26 tons) and the fact that the wagon is not supported by means of power jacks. Arrangements for jacking up were provided, but are not used, and the sets are run in normal working resting on the wagon springs, which greatly simplifies their use.

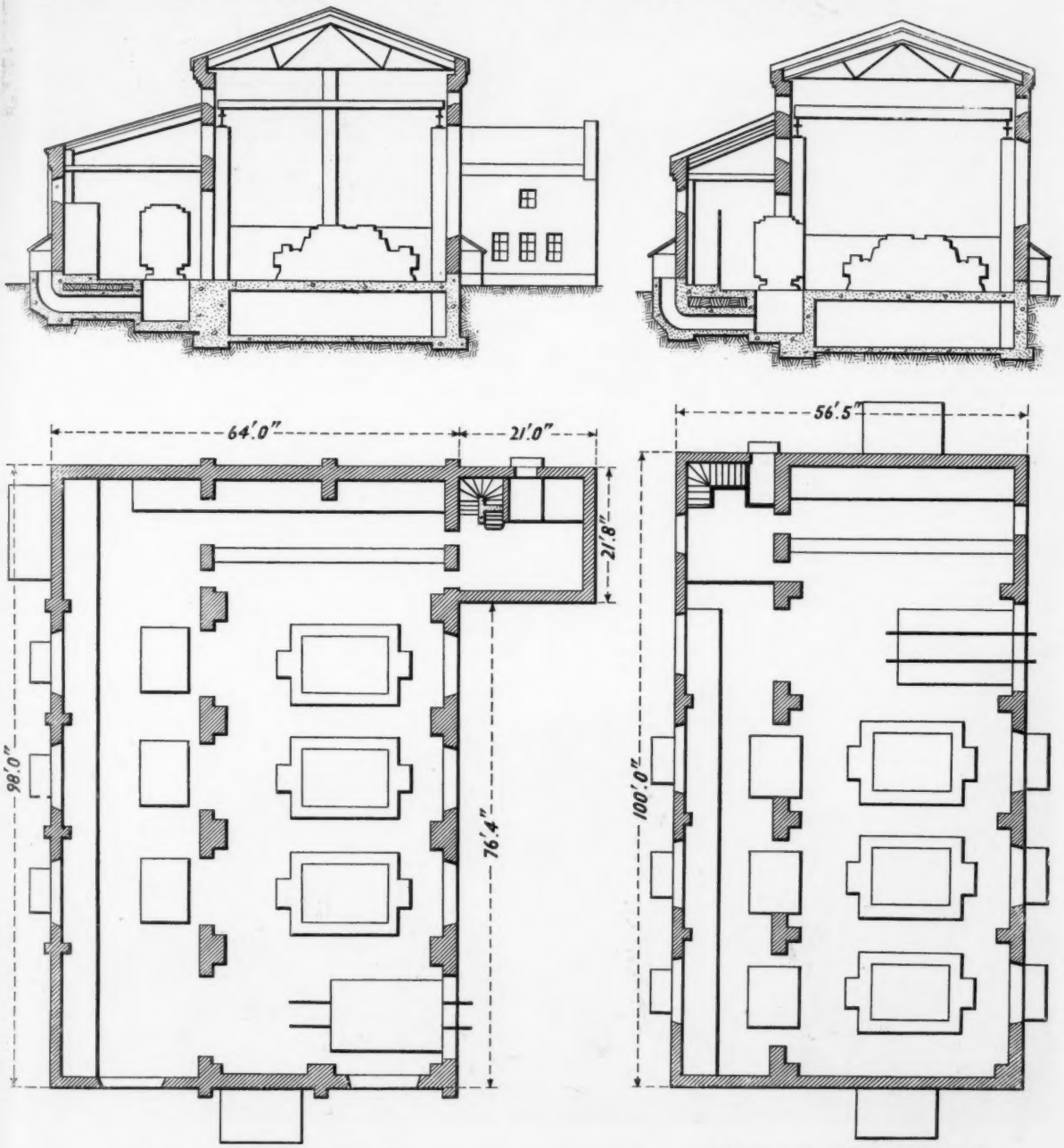



*Diagram of substation Type I*

*Diagram of substation Type II*

A transformer is provided for each alternator for stepping up the single-phase voltage to the 16 kV. used in the contact wire. Where the sets are stationary this transformer is placed in their immediate vicinity, but on mobile sets it is housed in a special two-axle transformer car. This also contains the equipment necessary for starting and running of the motor-alternator.

The motor-alternator sets are started on one-third voltage, when the motor, due to eddy-currents in poles and pole plates, starts as an ordinary induction motor and finally pulls itself into synchronism. An ammeter is provided showing the current induced in the field winding during starting up. When this current falls to zero the motor has reached synchronism. Reduced voltage for starting is obtained from an auxiliary transformer which on mobile sets is enclosed in the same tank as the single-phase stepping-up transformer.

### Synchronisation

With a 12-pole-4-pole frequency-changer it is possible for the single-phase voltage, although in synchronism, to be out of phase with that generated by other sets in the station. With six pairs of poles on the motor it can run in synchronism in six different positions, only one of which gives correct phase relation on the low frequency side. A synchronoscope is provided for checking the phase relation before connecting in on the single-phase side, and should it be incorrect, the motor must be brought to change phase. This is done by reversing the motor field, when the machine falls behind one pole division for each reversal. A maximum of five reversals will therefore eventually put the alternator in phase with the existing single-phase supply. The reversing of the excitation is carried out by means of reversing the motor exciter field which for this purpose during starting up is fed from the alternator exciter.

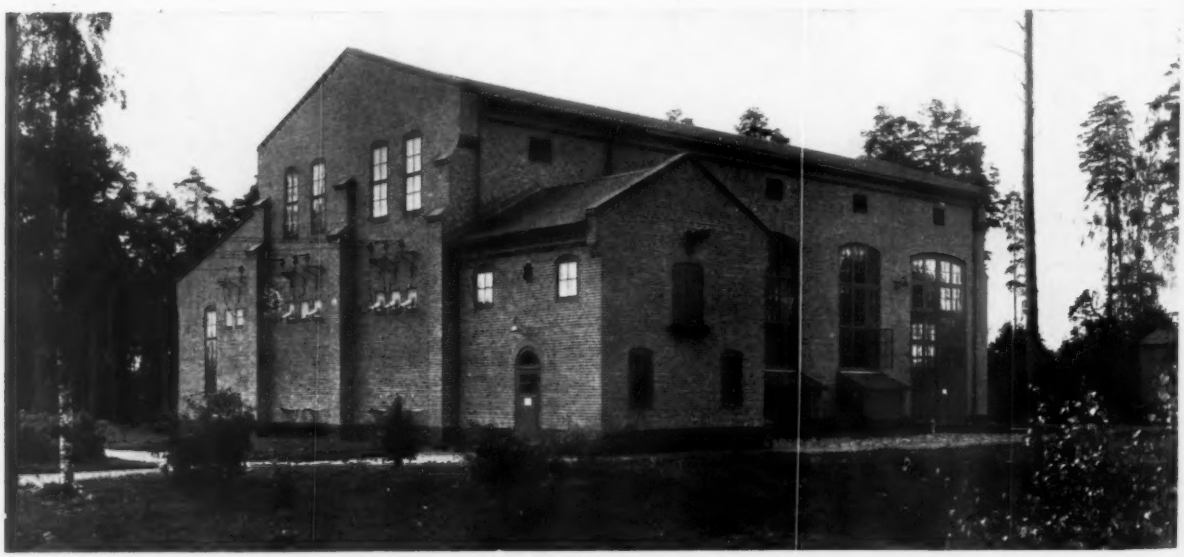
Along one of the shorter walls of the room in substations with stationary equipment, an instrument and operating panel is provided for the measuring and control of incoming three-phase and outgoing single-phase power and also for the arrangements required for starting, regulating and controlling the motor-alternators. Where mobile sets are used this panel is subdivided in such a manner that the part with the instruments and apparatus for starting, regulating and controlling each motor-alternator is arranged in the transformer wagon, and the part for the incoming and outgoing power is mounted in the control room in the shed.

*Interior of Type I substation, Södertälje*

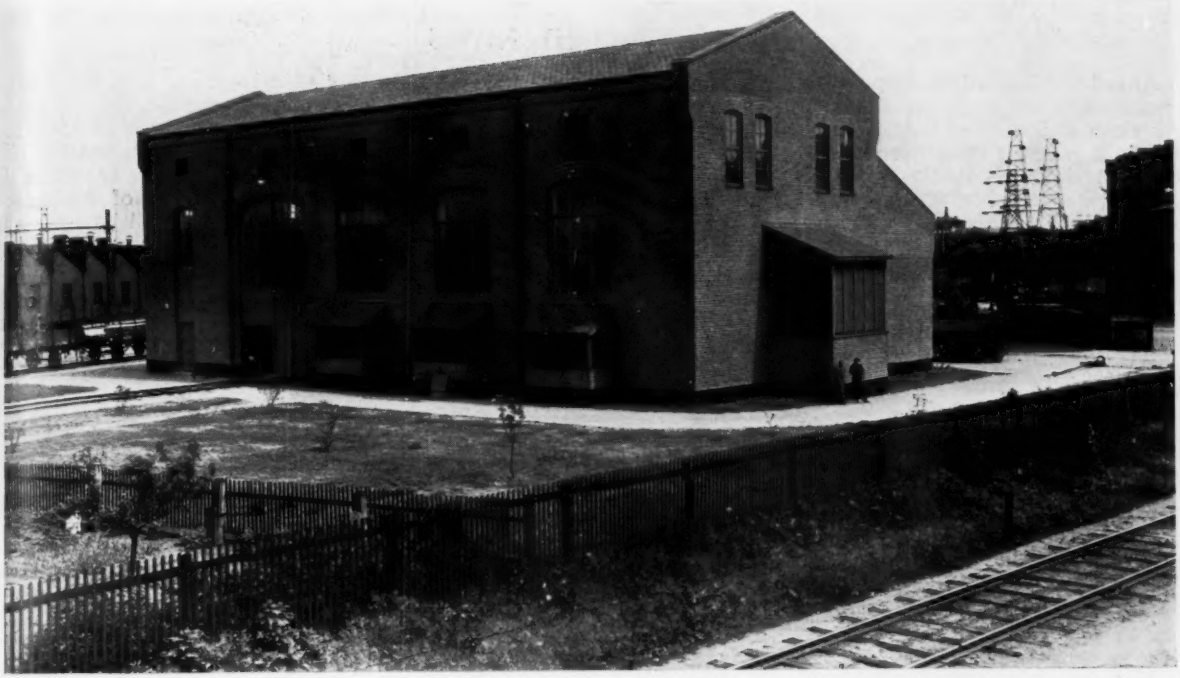
Quick-acting regulators of the Asea type are provided both for motor and alternator control by means of which also the three-phase voltage and reactive power delivered to the grid can be regulated. On mobile stations these are mounted in the transformer wagon.

### Starting Operations

A combined master switch and field reverser is provided on the motor control panels for the starting and synchronising of the sets. The switch has three positions: stop, start, and run. Solenoid-operated circuit-breakers connect in the motor on obtaining operating current from the master switch in the start position. Semi-automatic operation with foolproof interlocking is provided. The



*Outside view of Type I substation at Södertälje, Swedish State Railways*



***Outside view of Swedish State Railways' substation Type II at Malmö***

time required for starting up the set is 9 min., and the closing down operation is instantaneous.

The oil circuit-breakers required for starting operations are in the stationary equipments arranged along the side of the building in a switch-gear gallery, which also houses the circuit-breakers for the incoming three-phase supply with their metering equipment, and, further, the arrangements for the 50-cycle lighting supply to the railway. In substations of type III the starting gear is housed in the transformer wagons and the remaining equipment in a special switchgear room in the substation shed.

The single-phase line breakers for the outgoing supply to the railway lines in the substations of type I and II are arranged along the outer wall behind the operating panel. The number of breakers provided varies with local requirements from two to six.

In all substations with the exception of the five earliest equipments quick-acting circuit breakers are provided which are capable of interrupting the current in half a cycle. These breakers are arranged to disconnect immediately on the occurrence of a fault and then to reclose automatically over a resistance 5 sec. later. If the fault then remains, two further tries are made, one after 30 sec. and the last 3 min. later, and should both of these fail, due to a permanent fault, the attention of the staff is called by the sounding of an alarm signal. They then have to isolate the fault by sectionalising and switching out of the damaged line section at site.

Substations of type I and II have the sets mounted on one level as shown by the sectional views, but a cellar is provided containing the ventilating air ducts and certain apparatus remotely-controlled from the switchboard. A 30-ton electric crane is provided for lifting the machinery during installation or maintenance. In most stations there is also an 80-ton load platform which can be lowered in the floor to allow maintenance of the large transformers belonging to the outdoor grid substation.

(*To be continued*)

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RECTIFIERS IN ITALY.—Mercury arc rectifiers of Italian and Swiss manufacture are being used in all the new d.c. electrifications of the Italian State and private railways, both high-tension and low-tension. In the second category is an Oerlikon rectifier on the Milan–Varesio 750-volt d.c. line; it has a continuous capacity of 1,500 kW. (2,000 amp., 750 volts), and a capacity of 3,000 amp. for two hours and 6,000 amp. for five minutes after a period of operation on normal continuous load. On the Pracchia–San Marcello–Pistoia line, electrified at 1,350 volts, glass bulb rectifiers are used to convert the 6,300-volt, 50-cycles three-phase current to d.c. The glass is of a special type containing molybdenum. In Rome the tramway and local railway has purchased a mobile substation, mounted on a special wagon, which includes a steel tank rectifier with a capacity of 740 amp. continuously at the d.c. voltage of 725. The incoming current is 10 and 20 kV., 45 cycles a second, three-phase.

ITALIAN ELECTRIFICATION PROGRESS.—Eight further streamlined triple-car electric trains have been ordered by the Italian State Railways for the 3,000-volt d.c. lines. Extremely comprehensive trials have been conducted on the six trains built last year in order to determine the best possible arrangement and equipment for future stock. According to the last annual report, the State Railways had, on June 30, 1936, 1,662 km. of route electrified on the 3,700-volt three-phase system; 118 km. on the 10,000-volt three-phase system; 1,389 km. electrified on the 3,000-volt d.c. system, and 72 km. on the 750-volt d.c. principle. This total of 3,241 km. electrified was supplemented by 650 route km. actually under conversion for completion in 1937, in addition to certain lines whose conversion was within a month or two of completion. A decision was made during 1936 to begin conversion work on a further 1,054 route km. of line, including the Milan-Bologna-Ancona and Rome-Leghorn routes.

XUM

# NOTES AND NEWS

**American Technical Reports.**—Reports have been presented to the Electrical Section of the Association of American Railroads on the clearances for third rails and overhead contact lines; protective devices and safety rules on electrified lines; track and third rail bonds; supervisory control of substations; high tension cables; and corrosion-resisting materials.

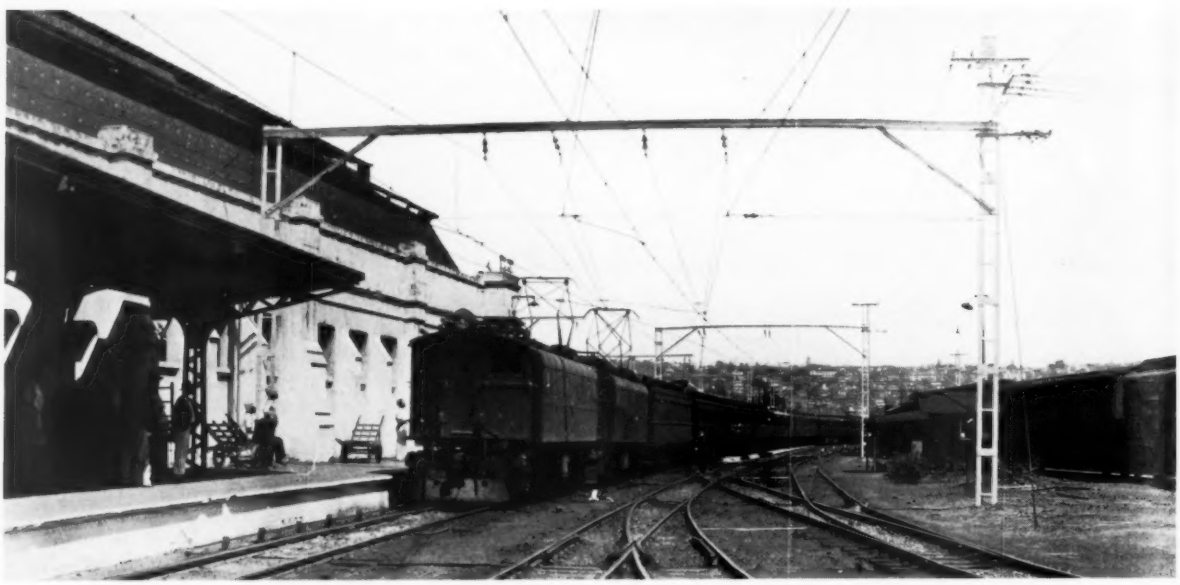
**Roller Bearings on Electric Stock.**—Twenty-two motor-coaches and a large number of trailers on the Metropolitan section of the London Passenger Transport Board are fitted with Timken taper roller bearings, and four of the motor-coaches have made mileages of 350,000 to 380,000. The total car miles of the motor-coaches is approximately 4,700,000. These Timken boxes are lubricated every four months, when about 1¼ gills of oil are placed in each box.

**Liverpool Electrification.**—According to the *Liverpool Post* there is a possibility of further suburban lines round that city being electrified. Electrification is assuming increased importance as a solution of part of the traffic congestion problem, but smoke abatement has been mentioned in discussions between the railway and local bodies. Good progress is being made with the Wirral electrification, and the excavation of a site for the repair shops for the rolling stock is proceeding at Birkenhead North.

**Russian Trunk Line Electrified.**—After several false alarms the opening of the Chussovskaia–Goroblagodatskaia main line in the Urals to electric traction appears to have become a *fait accompli* during the past four weeks. At the west end it connects with the electrified section of the Perm Railway and at the east end with the electrified line from Sverdlovsk, and 3,000 volts d.c. electric traction now is in force from Sverdlovsk right through to Kizel, a distance of 240 miles. The mineral traffic is of much greater proportions than the passenger traffic.

**5,000-h.p. Locomotive.**—For working heavy express traffic over the Leipzig–Halle–Nuremberg main line, now being converted to 15 kV single-phase, the German State Railway is designing a 1-Do-1 locomotive, to be classified as E.19, which will have a one-hour rating of 5,000 h.p. It is intended for a top speed of 110 m.p.h. and will haul 360-ton trailing loads up the long 1 in 40 grades in the Thuringian forest at a sustained speed of 60 km.p.h. (37 m.p.h.). Dr.-Ing. Walter Reichel is collaborating with the Reichsbahn officials in the design of this locomotive.

**New York Transport.**—The Brooklyn–Manhattan Transit Corporation has sanctioned the enlargement of its Williamsburg steam power station at a cost of £900,000, and is proposing to make a short extension to its subway. Proposals also are on foot for the New York Board of Transportation to purchase 250 motor coaches and trailers at an estimated cost of £1,900,000. It is possible that in the near future trains from the high-speed suburban line of the New York, Westchester & Boston Railway will be brought into downtown New York by a connection with the elevated lines of the Interborough Rapid Transit system. New semi-streamlined electric trains will be built if this course is sanctioned.



*The first ordinary main-line train to enter Durban under electric haulage, South African Railways*

**South African Activities.**—The illustration on this page shows the first ordinary main-line train to be electrically-hauled into Durban—on December 2, 1936. It is headed by two of the Metro-Vick 1,200 h.p. electric locomotives. In a recent address to the Congress of Electricity Undertakings, held in Johannesburg, Mr. D. Liebrandt, former Chief Electrical Engineer, and now Chief Stores Superintendent of the South African Railways, said that the electric locomotives, of which there are now over 100, work 15 hours a day compared with the average of 9·6 hours for the steam engines; the repair cost per mile for the electric locomotives was 2d. against the 12d. for steam. By the end of 1937 over 1,000 track miles of line would be electrified in the Union; approximately 257,000,000 kWh of energy would be purchased for traction purposes at a yearly cost of £587,000, and the electric motive power would consist of 135 locomotives and 193 motor-coaches.